RUBBER and PLASTICS WEEKLY

VOLUME 141 NO. 4 JULY 22 1961 ONE SHILLING

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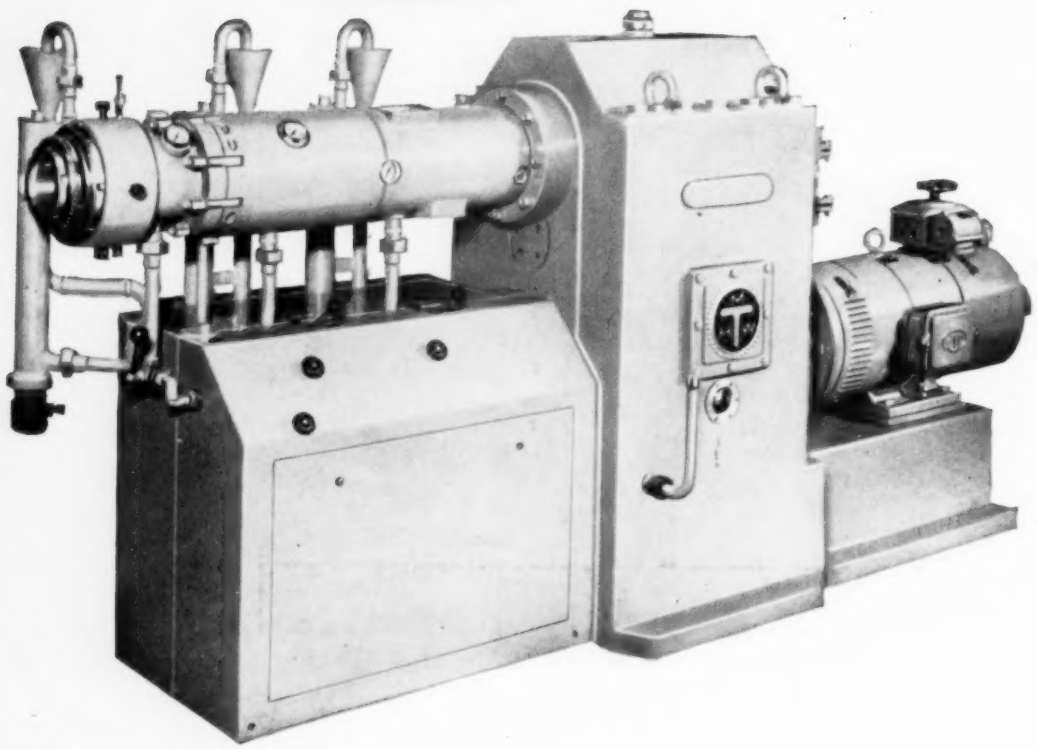

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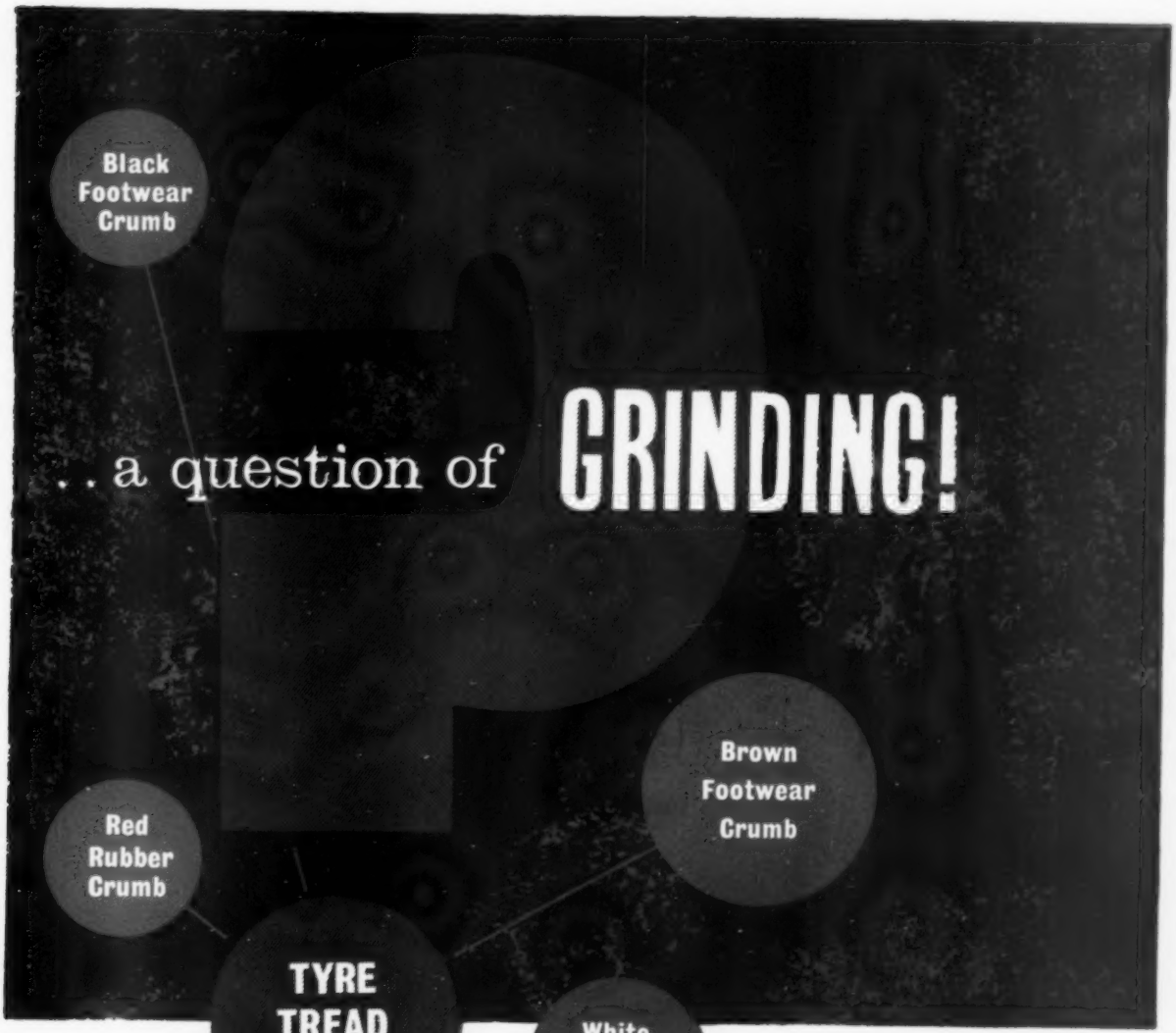

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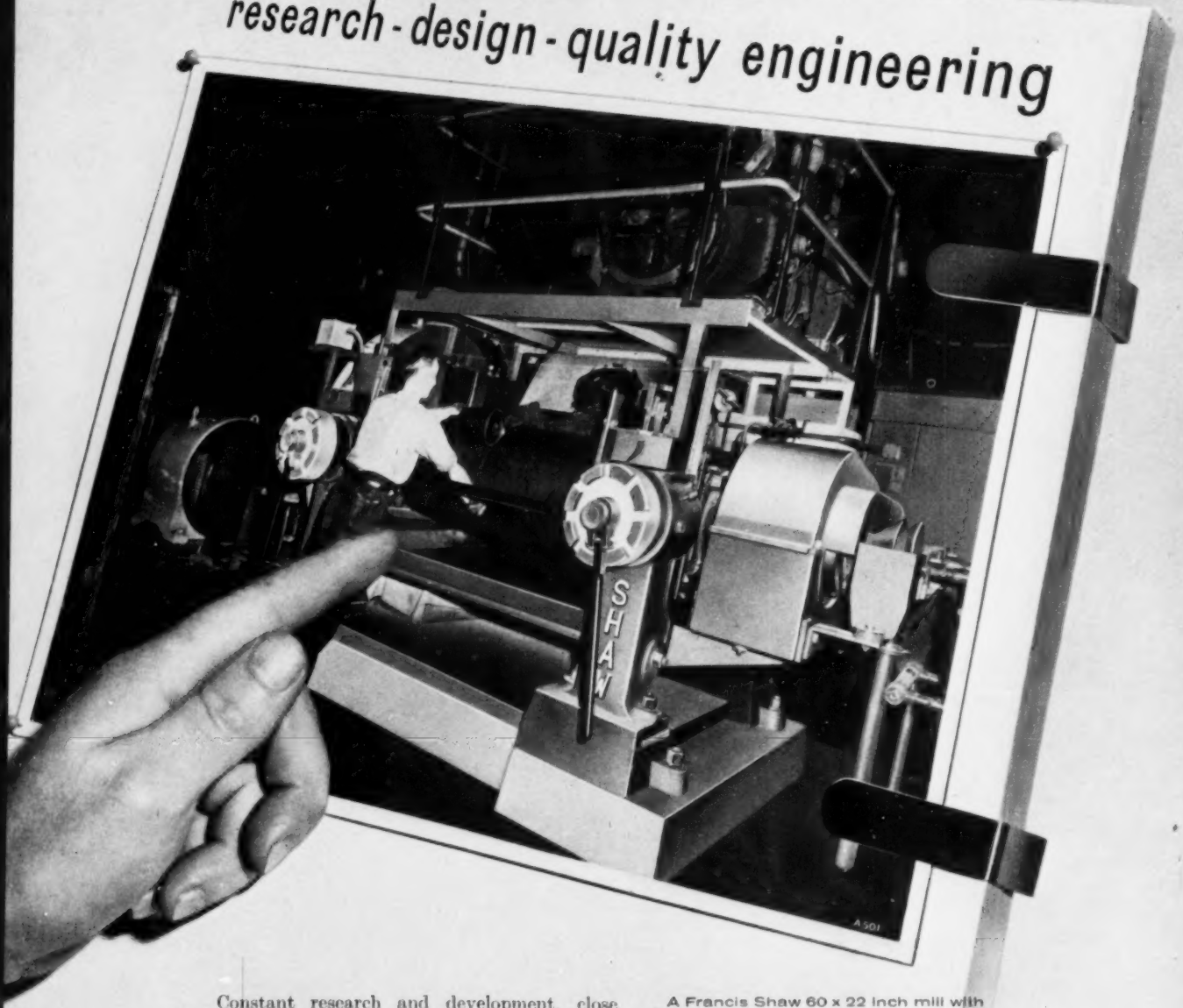

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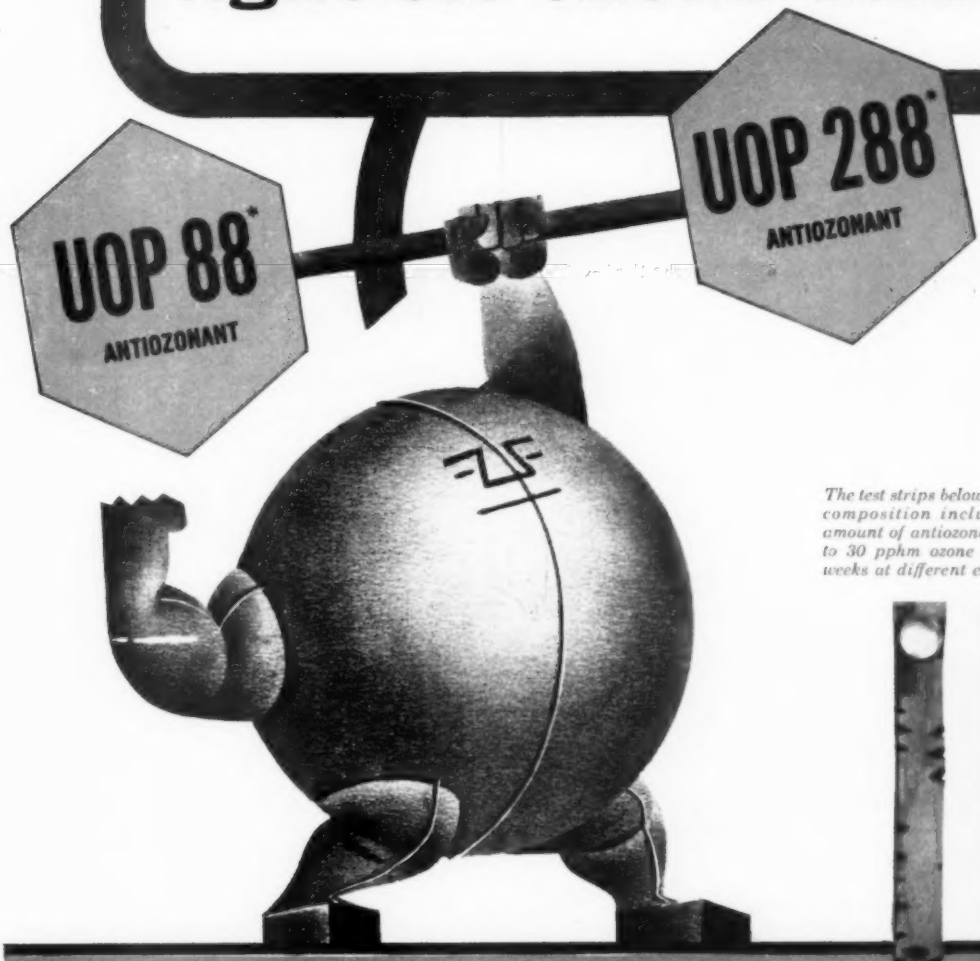
OVERSEAS AGENTS THROUGHOUT THE WORLD

P4452

how can rubber under STRESS fight off ozone attack?



The test strips below, both of identical composition including kind and amount of antiozonant, were exposed to 30 pphm ozone at 100° F for 2 weeks at different elongations.

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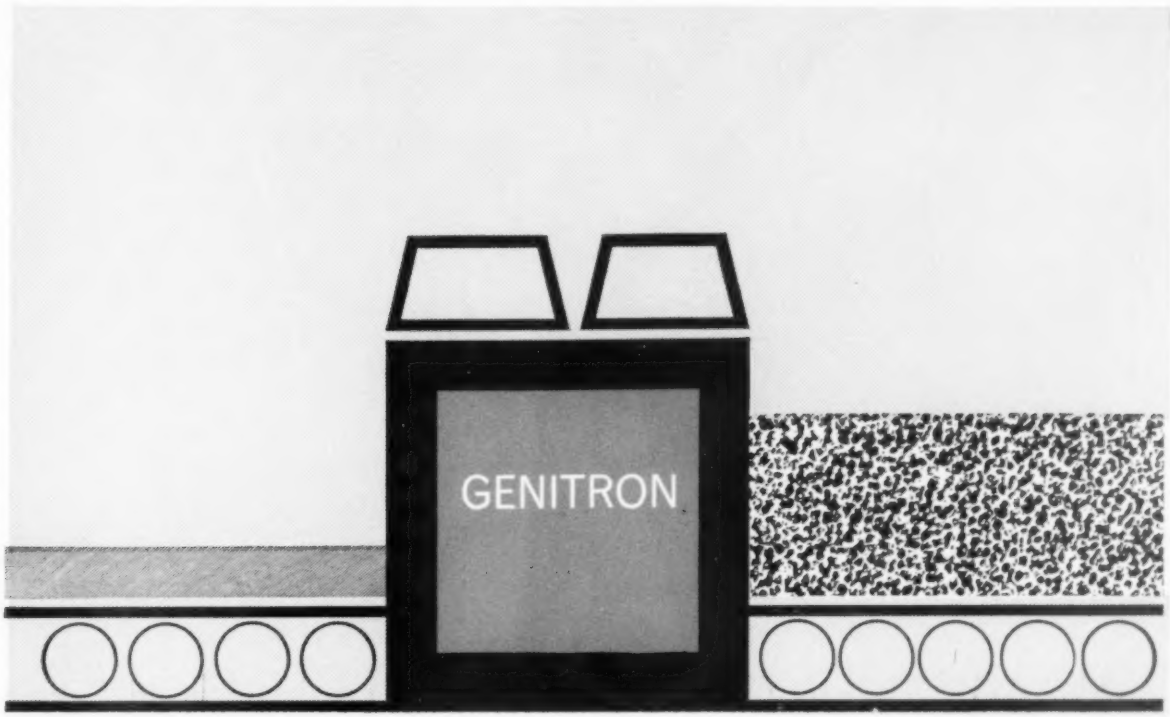

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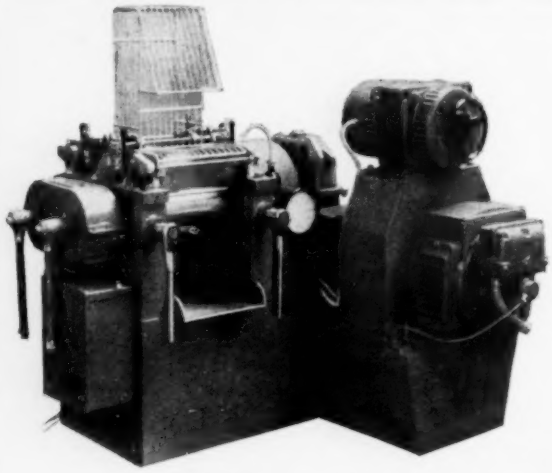

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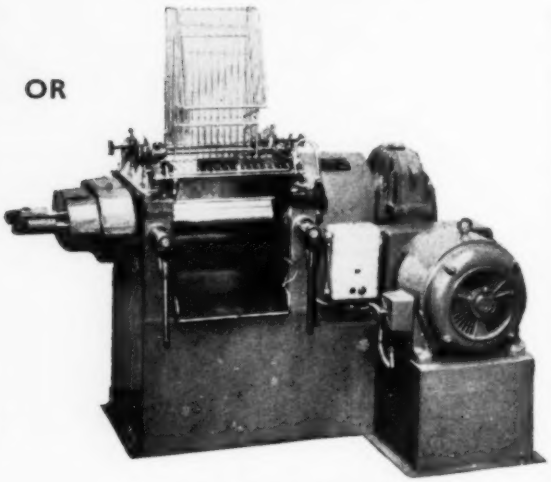

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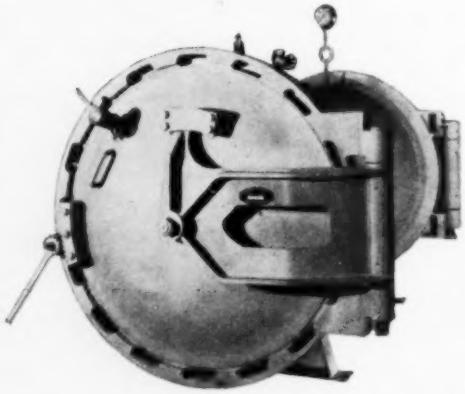

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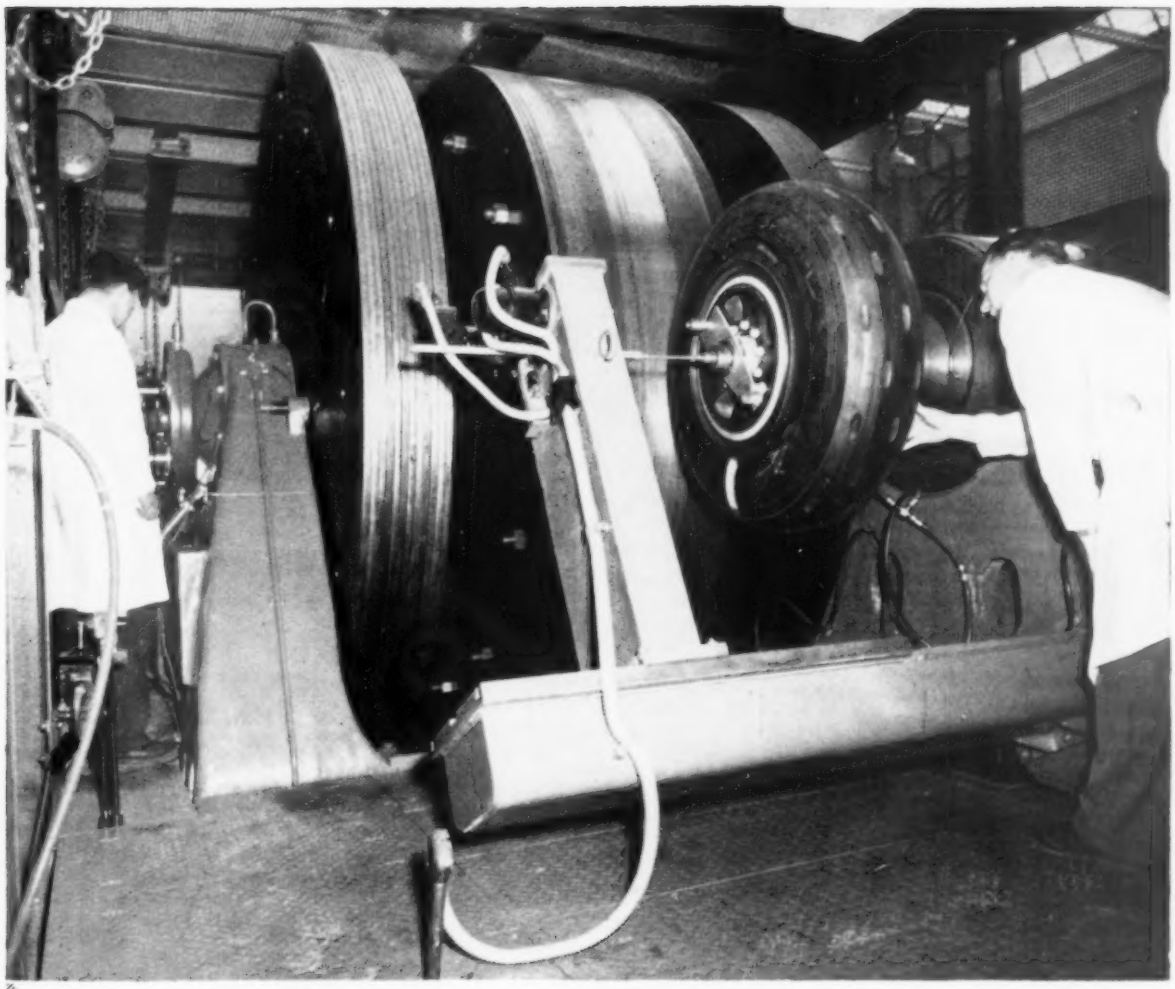

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RUBBER and PLASTICS WEEKLY

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Volume 141 IN ITS 77th YEAR No. 4

July 22 1961

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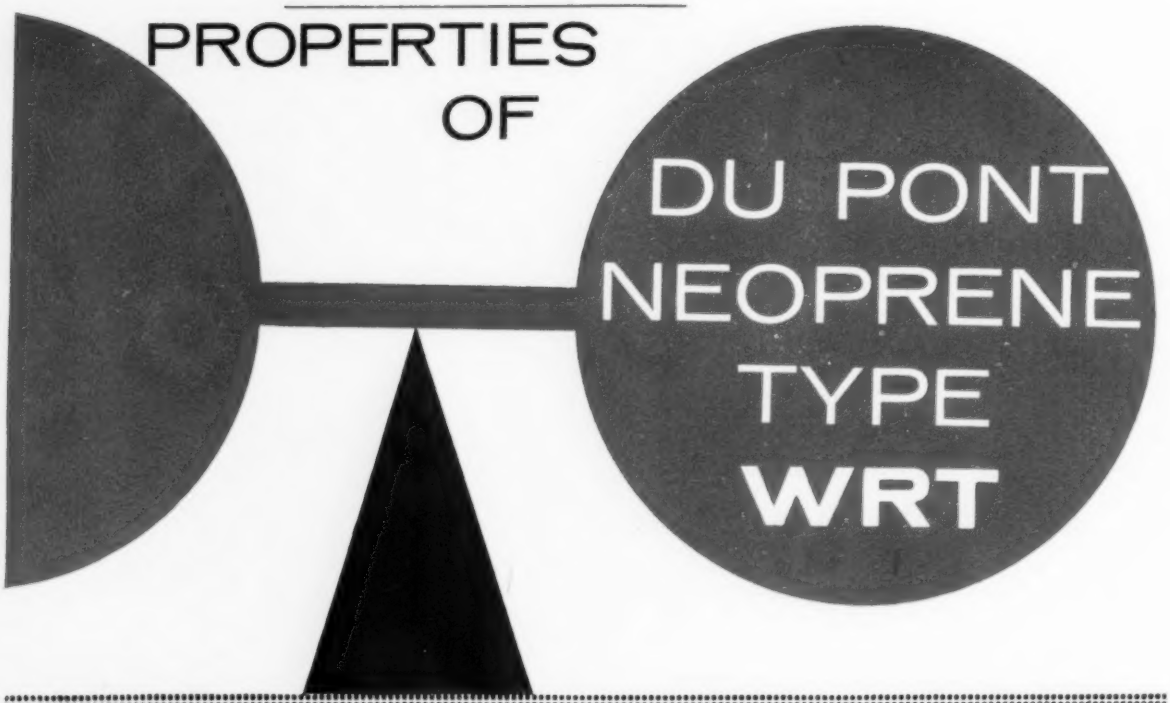

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Rubber and Plastics Weekly

NOTES of the WEEK

Pattern of Change

THE retiring president of the Federation of British Rubber and Allied Manufacturers in 1959, Jasper Frankenburg, said to his successor, H. G. W. Chichester-Miles, that the industry was entering a period of change. He did not exaggerate. The last two years have been eventful ones for the rubber industry, as can be seen from a review of his period of office by Mr Chichester-Miles, who retires as president next Thursday (July 27).* The economic pattern, the materials pattern, the organization of the industry's Federation and its Research Association — all have changed.

So far as the Federation itself is concerned, the main alteration has been its reorganization on a direct membership basis, rather than through associations. Although this system has only been working for a short time, it is already representative of 90% of the industry. The Federation has been concerned with adjustments to bring more order into the world of rubber: on the materials side it has played a major part in systematizing the marketing of grades of natural; on the standards side more than 900 copies of the *Guide to the Drafting of Specifications for Rubber Products* have been distributed and are helping to reduce the number of time-wasting requests, such as 'something like this, please, in best quality rubber'. All these changes are helping to make life easier for the rubber manufacturer.

In his review Mr Chichester-Miles gives a warning. He points to the fact that profit margins are declining, and regrets that the Government now has powers for raising taxation by means which can only increase the costs of production. It seems likely that, in three days' time, the Chancellor of the Exchequer will invoke these powers. This means that the new president, Maurice Baker, is taking over at a difficult period. But if he handles his office as firmly and diplomatically as the retiring president, the rubber industry can be sure of a strong lead from the top whatever Mr Lloyd produces from his dispatch case. RUBBER AND PLASTICS WEEKLY wishes him every success when he takes up his appointment on Thursday.

Know your Scrap

NO manufacturer can test every batch of polymer or chemical that he uses. But standards of manufacture in this country are high, and with the control procedures carried out by both users and manufacturer it is not very often that mistakes are made. Particular care has to be taken with scrap material if it is not bought from a reputable merchant. An odd case involving scrap plastic is given in the *Report of the Government Chemist*, published by the Department of Scientific and Industrial Research. Several cases of bangles were transported by aircraft from Bombay to West Africa. They gave off fumes during the flight and caused temporary loss of consciousness in some of the crew. Afterwards the manufacturers said that the bangles were made from cellulose acetate safety film scrap and had been given a brilliant finish by dipping in tetrachlorethane. Chemical analysis confirmed the presence of residual amounts of a chlorinated hydrocarbon, which could cause unconsciousness if breathed in sufficient concentration for a prolonged period. The manufacturer must have felt even more uncomfortable when the analysis brought about by his carelessness in processing also showed that the bangles, which were built up from layers of different coloured material, contained cellulose nitrate. Which meant, on top of everything else, that he had contravened the safety regulations.

This may be an out of the way case, but it illustrates a valuable point — so far as scrap is concerned, know what you are buying. Test or, since life and balance sheets are too short to test everything, buy from the reputable merchant. A good rubber and plastics scrap merchant protects his name by the quality of the materials he sells, just as the manufacturer builds up a reputation for the trade names of his polymers and chemicals.

Ambergris, Forgeries — and Polymers

THERE must be few chemists in the polymer industry who do not now and again stray outside their field — if not in their laboratory work, then in their reading. It can lead (although this is hardly ever the object), by a kind of mental cross-fertilization, to some valuable results. The *Report of the Government Chemist*, mentioned above, is just the sort of document to provoke such dilatory reading. This year's report touches on such diverse topics as the theory of formation of ambergris, the determination of opium alkaloids, water fluoridation and the detection of handwriting forgeries. And if you are interested neither intrinsically nor in a 'cross-fertilization' kind of way, then it can be read as a model of report writing, reaching the standard that might be expected from the oldest Government chemical institution in the Commonwealth.

*A condensed version of this review appears on page 135.

NEWS *Briefs*

FIRESTONE FORECAST TYRE RECORD — ENJAY EXPAND — MOBIL PLANT IN ITALY — GOODYEAR IN TURKEY — MB IRISH PACKAGING FACTORY

●**United States** — The development of a new commercial halogen-free platinum reforming catalyst — said to be the culmination of years of research, has been announced by Houdry Process Corp. In the field of catalytic reforming with platinum catalyst, it has been generally thought up to now that a halogen was a necessary component of the catalyst system. The new catalyst, which is being produced at Houdry's plant in Paulsboro, N.J., contains the same amount of platinum as other Houdry forming catalysts. It is said to be readily regenerated.

●**Angola** — A subsidiary of Manufactura Nacional de Borracha, the Portuguese tyre concern, is to be set up in Angola. The project will have an investment of 150m. escudos (£1.9m.) and annual production is expected to reach 60m. escs. The concern is associated with General Tire and Rubber Co., of Akron, Ohio. Terms have been laid down so that shareholders may not receive dividends higher than 10%. Over this, profits must be used to set up rubber estates in Angola.

●**United States** — The Firestone Tire and Rubber Co. has received a $700,000 order from the US Air Force for tyres for F-105 jets. These Mach 2 fighter-bombers are employed by the Tactical Air Command at bases throughout the world.

●**Turkey** — The Goodyear Tire and Rubber Co. has been granted authorization by the Government of Turkey to form a $13m. company in association with local interests to build a tyre factory. The factory, which will employ approximately 300, will be in production within two years. The initial capacity will include a complete line of passenger truck and agricultural tyres and tubes as well as tread rubber and other tyre repair materials. The new company will be known as Goodyear Lastikleri Turk Anonim Sirketi.

●**United States** — The capacity of Humble Oil and Refining Co.'s polyolefine plant at Baytown, Texas, is currently being expanded by approximately 50% — from an initial rated capacity of 40m. lb. per year. The Enjay Chemical Co., a division of Humble, has announced that this phase of the expansion programme will be completed by November. Enjay, which markets Escon polypropylene produced at Baytown, said plans have also been approved for a second expansion, which will double the plant's capacity by the second half of 1962.

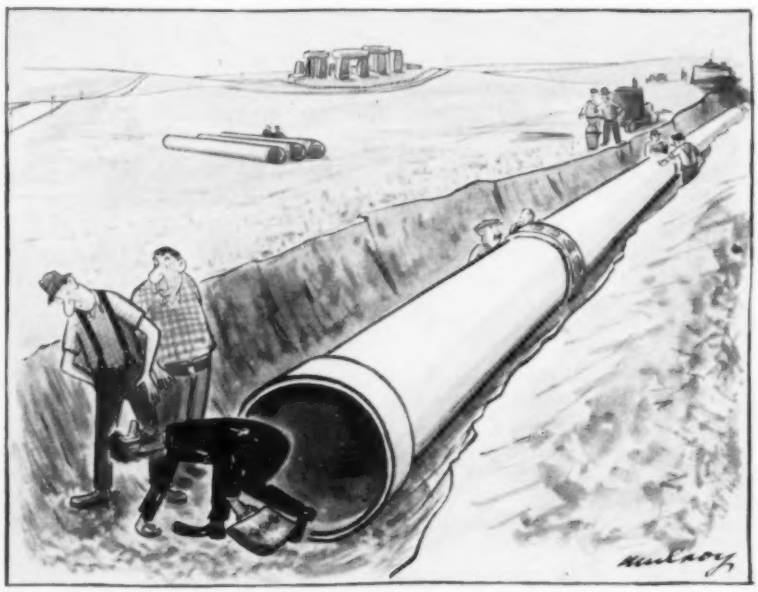
●**Germany** — Production of HAF and ISAF carbon blacks is due to start in September at the Kalscheuren works of Deutsche Gold- und Silberscheideanstalt AG. Combined annual capacity will be 12,000 tons initially, but this will be doubled by the end of next year. Production of these two types of carbon black was started last month by the 50% Degussa subsidiary KG Deutsche Gasrusswerke GmbH with a combined annual production equal eventually to 25,000 tons.

●**United States** — The Firestone Tire and Rubber Co. has announced plans to produce two-ply tyres for next year's models of several standard sizes of cars, as well as for most compact cars. The company is already producing two-plys as original equipment for some of this year's compact models.

●**Italy** — The contract for the construction of a petrochemical plant in Naples for Mobil Chimica Italiana (an affiliate of Socony Mobil Oil) has been awarded to Compania Tecnica Industrie Petroli of Rome. The new plant is scheduled to go on stream early in 1963 with an initial capacity of 150,000 tons a year, and will process products from the nearby Mobil Oil Refinery to produce orthoxylol, paraxylol, benzol and ethylbenzol.

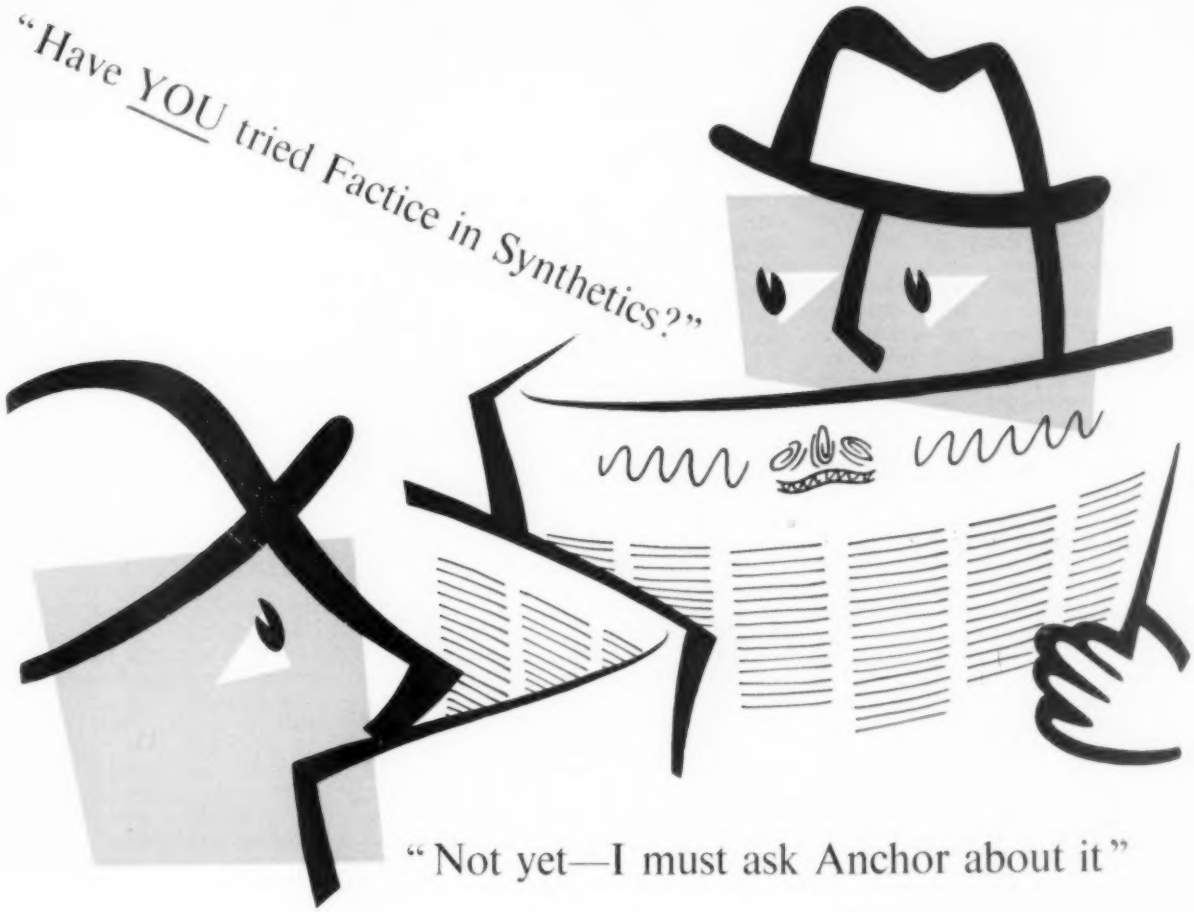
●**Eire** — A plastics packaging factory is to be constructed at Ballyfermot, Dublin. This is a joint venture by Metal Box and the Irish Glass Bottle Co., and is expected to provide employment initially for about 150 people, mainly men, although it is anticipated that this number will increase considerably as the industry develops. Initial capital expenditure on the project will be £300,000 and it is expected that production will begin in about a year's time.

●**United States** — Raymond C. Firestone, president of Firestone Tire and Rubber has predicted that this year a record of 71m. passenger replacement tyres will be sold in USA and that this record achievement will help to make 1961 the second best year in history, despite decreases in original equipment sales. Original passenger tyre equipment sales in 1961 are estimated at slightly over 30.2m. units compared with 36.3m. in 1960.



'Actually I crawled in to check a rubber ring up in Derbyshire and I must have dozed off!' — 546

"Have YOU tried Factice in Synthetics?"



"Not yet—I must ask Anchor about it"

Anchor Bulletins supplied on request

146/R/59	Factice in Neoprene Compounding
154/R/60	Dark Factice in Butyl Rubber
155/R/60	Dark Factice in Nitrile Rubbers
156/R/60	Factice in SBR
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Synthetic Rubber Institute

ORGANIZATION WILL ESTABLISH BELGIAN BASE

HERMAN R. Thies, newly-elected president of the International Institute of Synthetic Rubber Producers, has stated that the organization will establish an office in Brussels, Belgium.

He said that the Brussels office 'will further expand our world-wide network to promote the interests of synthetic rubber manufacturers and the public in production, engineering, safety, transportation and other industry problems'.

Mr Thies, general manager of the Goodyear Chemical Division in Akron, Ohio, was elected institute president at the group's second annual meeting in New York, succeeding T. L. Cubbage, vice-president of Phillips Chemical Co.

The institute is considering sponsorship of several fundamental research projects. These include investigations of test methods relating to molecular weight distribution, chemical analytical test methods for determining components of synthetic rubber and a method of determining viscosity of rubber during manufacture.

Organized in 1960, the institute encourages development of international trade in synthetic rubbers. It also receives, prepares and distributes information concerning the industry and co-operates with governmental departments and agencies on industry matters.

Mr Thies started his career in rubber in 1930 as a research compounder. He later became assistant Goodyear research director and in 1948, when the company organized its chemical division, he was appointed general manager.

Other officers elected by the Institute this year are Tara Matsuda of Japan Synthetic Rubber Co. Ltd., vice-president of the North American section; Ludwig Bornhofen of Chemische Werke Huls, vice-president of the European section; George Hackim of General Tire and Rubber Co., secretary, and J. C. Roberts of Firestone Synthetic Rubber and Latex Co., treasurer. Bancroft W. Henderson, managing director of the institute, was elected assistant treasurer.

£2m. Polish Contract for Courtaulds

A £2m. contract for the supply of a synthetic fibre factory to Poland has been gained by Courtaulds and its subsidiary, Procindus, in the face of stiff competition from US and German firms.

The contract, for an acrylic fibre plant, has been awarded by Polimex — Polish Export and Import Company for Machines — of Warsaw.

Deliveries will be made in 1963, and it is understood that the plant will be sited at Lodz.

In April last year Courtaulds obtained contracts for the USSR worth £15m. for supplying plants for viscose tyre cord, acrylic fibre and acetate yarn.

Fresh Outlets for PVC Stabilizers

F. W. Berk and Co. Ltd.'s Tribase (tribasic lead sulphate), which has up to now been particularly used for the stabilization of rigid articles and electrical insulation, is now, the company announces, finding expanding use in general purpose pvc compounds. This is because of its freedom from gassing — the increased speed of modern pvc production methods has created a new demand for stabilizers which remain unaffected by the higher processing temperatures to which they are now exposed.

Another Berk stabilizer which has moved into a new market is Dythal (dibasic lead phthalate). Dythal is used for electrical insulation for high temperature applications, and recently it has found an outlet as an activator and stabilizer in the pvc 'foam-back' textiles.

The company has introduced a range of barium-zinc organic stabilizers (Temex), which not only eliminates the 'pinking' and 'blueing' which sometimes occurs with lead compounds, but also permits the use of a wider selection of pastel shaded stocks, and gives freedom from sulphur staining.

Russian Minister at Welwyn

NIKOLAI S. Patolichev, the Soviet Minister of Foreign Trade, who opened the Soviet Exhibition in London, visited the headquarters of I.C.I. plastics division, Welwyn Garden City, last week.

N. S. Patolichev (hand on chin) in the I.C.I. plastics division research laboratories. His interpreter (*left*) is putting a question to Dr J. W. C. Crawford, the research manager

Mr Patolichev met J. C. Swallow, chairman, and other directors of the plastics division before touring the research and technical service laboratories, which have been described as among the finest of their kind in the world.

The visit was requested by Mr Patolichev himself. The USSR has been an important customer of the plastics division for many years. Last year, the division staged an exhibition in Moscow and Leningrad featuring its plastics materials.

I.C.I. sales last year to Russia and Eastern Europe totalled £5.5m.

With Mr Patolichev were V. I. Rodnov, head of the Soviet Trade Delegation in London, and A. I. Ivanov, head of the UK Section of the Soviet Ministry of Foreign Trade. They were accompanied by Niall Macpherson and T. F. J. Latimer from the Board of Trade.

Wentworth Tournament Now August 31

The Federation of British Rubber and Allied Manufacturers' annual golf tournament will be held this year at Wentworth on Thursday August 31 and not in October as originally planned.

All friends of the Federation in member and associate member firms are invited to take part. Forms can be obtained from the Federation at 19/20 Berners Street, London, W.1.

Fablon in Berkeley Sq.

Fablon Ltd. has moved to Berkeley Square. The address of the company —a member of the Commercial Plastics group — is Fablon Ltd., Berkeley Square House, Berkeley Square, London, W.1.

THE NAME IS INTEX

INTEX is the new group name for I.S.R. latices. The group comprises four types of latex for general and specialised use. Delivery is by road or rail tankers or in smaller quantities in drums. INTEX has these advantages: it is sold from stock at a stable price and delivered on time; it is consistent in quality and backed by an efficient and co-operative Technical Service which is constantly at the call of all rubber users everywhere.

INTEX 100	**A high solids, high quality latex, formerly known as Intex 62A, for use in foam rubber. Other uses—carpet backing, rubberised hair, adhesives, road making materials, impregnation of paper and non-woven fabrics.**
INTEX R.23	*A low solids, low cost latex suitable for use in carpet backing, roofing felt, paper impregnation, proofing, tyre cord dipping and upholstery.*
INTEX M23B	*A low solids, low cost latex with an improved Mooney viscosity. Uses—carpet backing, fibre impregnation, proofing and upholstery.*
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Venesta Enters Plastics

PLYWOOD FIRM TO PRODUCE EXPANDED POLYSTYRENE

VENESTA Plywood Ltd., a member of the £13m. wood products group, is to enter the field of expanded plastics. Yesterday (July 21) the company began a major reorganization at its Erith, Kent, factory, preparatory to the installation of plastics machinery.

Production will commence at the end of the year and, to begin with, will be concentrated on expanded polystyrene products. The first objective, starting in January 1962, is to reach an output of 1,000 tons.

The initial operation will absorb about £350,000 for machinery and working capital. The company indicates that 'a more substantial investment is likely to be required as the market in the UK is developed'.

Sales of expanded polystyrene will be handled by a separate selling organization, and the company is appointing a new marketing manager, who will direct all sales, whether to the building, packaging or other markets that will be created for the material.

Venesta Plywood is well established in the plywood trading, building products and container fields. It employs 500 people in factories at Erith, Clayton (Manchester) and Halesowen (Birmingham).

The decision to enter into expanded plastics has been made, the company says, after a very careful study. It believes that the UK is under producing. (Production of expanded polystyrene in Germany rose from 2,500 tons in 1956 to 20,000 tons last year — an increase of 800% in five years. In USA there was a 3,200% increase in the same period, production last year rising to 16,000 tons from 500 tons in 1956. Against these figures the 1960 UK total was 2,000 tons — only 10% of German production.)

Four Choices

A 'Plastics and Problems of Choice' congress will be held in Amsterdam from October 15-17 1962, preceding the third international plastics exhibition 'macroPlastic' at Utrecht (*RPW* July 8, 41). The congress will deal with subjects relating to the various problems of choice in plastics, both technically and economically.

It will be divided into four 'choices': (1) choice of material, (2) choice of processing technique, (3) choice of machines and tools, and (4) choice of degree of mechanization.

Irish Waterproofs

The Northern Ireland Ministry of Commerce is to build an 8,000 sq. ft. factory at Newry, County Down, for Northern Waterproof Ltd., an associate of J. Meek and Co. (Ireland) Ltd.

About 100 workers will be employed in the manufacture of waterproof garments. The company has already established in Newry a pilot plant for trainees, in preparation for taking over the new factory.

Northern Waterproof recently secured contracts to supply waterproofs to a number of police forces and fire brigades in the UK.

Indian Fair

The Board of Trade is providing an official UK exhibit and organizing a large commercial display of British products at the Indian Industries Fair, the international trade exhibition in New Delhi, which opens on November 14.

The Board has taken a site at the Fair of 66,000 sq. ft. on which the United Kingdom pavilion, covering about 40,000 sq. ft., is being built. It will be in two major sections. The first is to be devoted to the official exhibit 'Britain: India's Industrial Partner'. Polymer firms taking part in this include: May and Baker, Dunlop Rubber, British Oxygen and the Dowty Group. There will also be a commercial display by individual UK firms, including I.C.I., Dunlop Rubber, British Nylon Spinners and the Metal Box Co. of India.

Five More Monsanto Polythene Resins

ADDITIONS to its range of polythene resins for high clarity films have been announced by Monsanto Chemicals Ltd.

Three of the new grades are recommended by the company for use when 'first-rate optical properties are required'. They are: M.311 (natural grade), M.311-1 (natural medium slip grade) and M.311-2 (natural medium slip and anti-static grade). These have a nominal melt index of 2.0 and nominal density of 0.924.

The other new resins — M.505 and M.505-1, the base resin and slip grade respectively — are recommended both for blown film extrusion and chill roll casting.

They are similar to resins in the M.311 series, but their higher melt index — 5.0 compared with 2.0 — is said to provide exceptional draw down characteristics.

The total capacity of Monsanto's Fawley polythene plant is currently being increased from 17,000 tons to 25,000 tons a year.

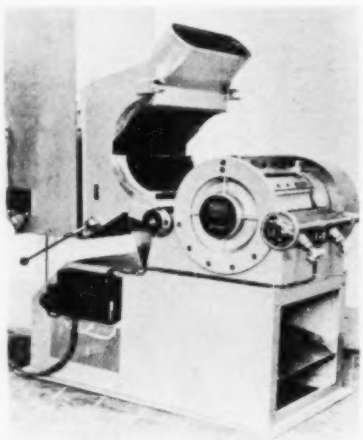
Commercial Consort

The Marley group has produced a heavy-duty grade of its Consort vinyl flooring for commercial use called 'Marleyflor Consort 70'.

Initially, five patterns are being marketed.

Dreher Newcomer

A NEW Dreher cutting mill — the S.42/65 — has been added to the range for granulating extrusions, mouldings, and sprues in pvc, polythene, polystyrene, nylon, foams and other materials.



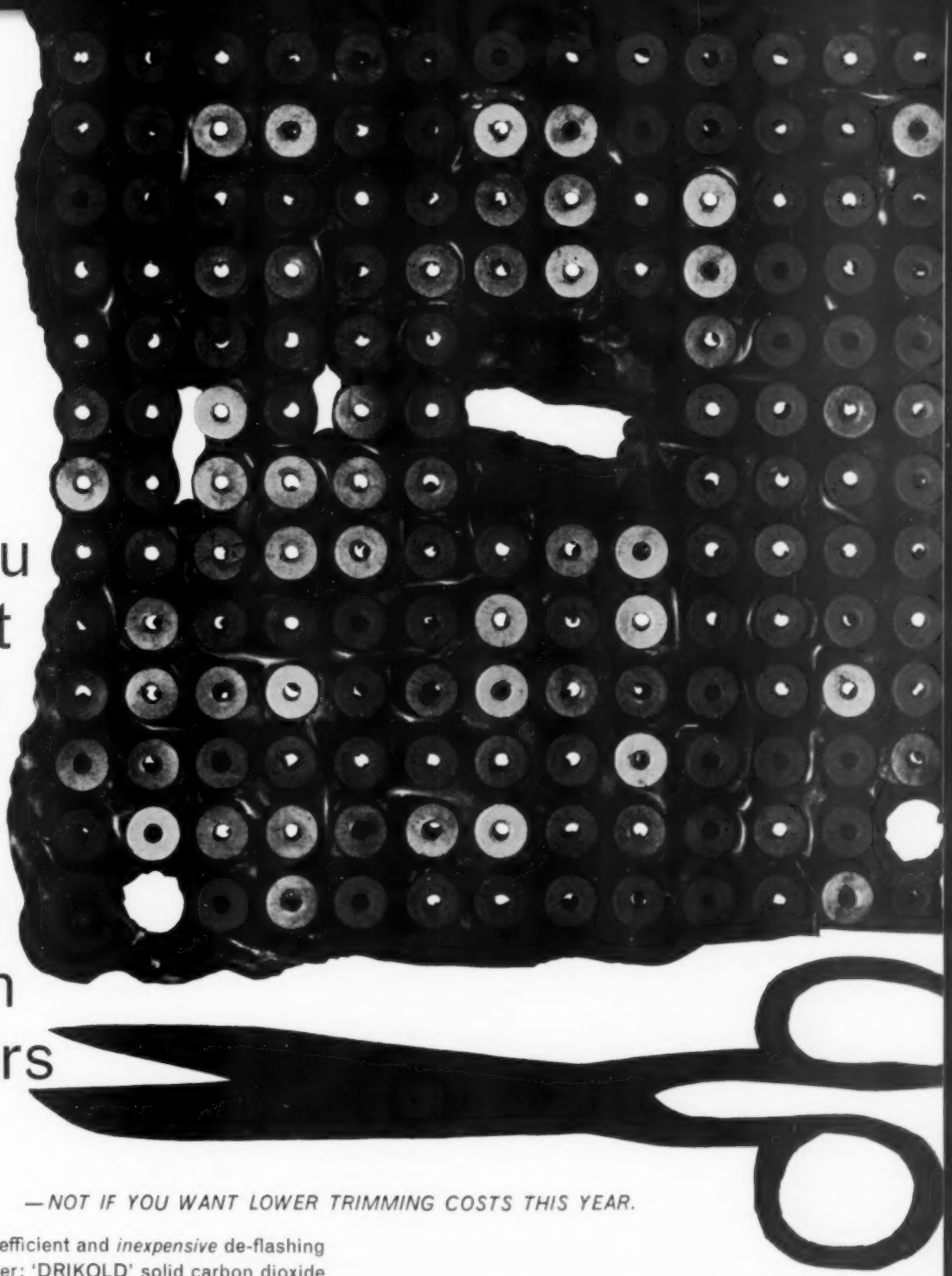
The Dreher mill can deal with up to one ton of material an hour

The model has a throughput of ½ to 1 ton per hour depending on the type of material. The throat size is 2ft. 5½in. by 1ft. 8½in., and the rotor is 1ft. 4½in. in diameter and 2ft. 1½in. wide. It operates at 650 revolutions per minute and the drive is by a 38 to 60hp motor. There are six rotary and two stationary blades.

Mesh screens have been located in relation to the rotary blades in such a way that heat is kept low and grains of uniform size are produced.

For cleaning, the machine top can be released and tilted back and the cutter patch swung away. All the usual safety precautions are built in.

The UK agents for the machine, produced by Heinrich Dreher of Aachen, Germany, is Baker Perkins Granbull Ltd., of Kingston-on-Thames.



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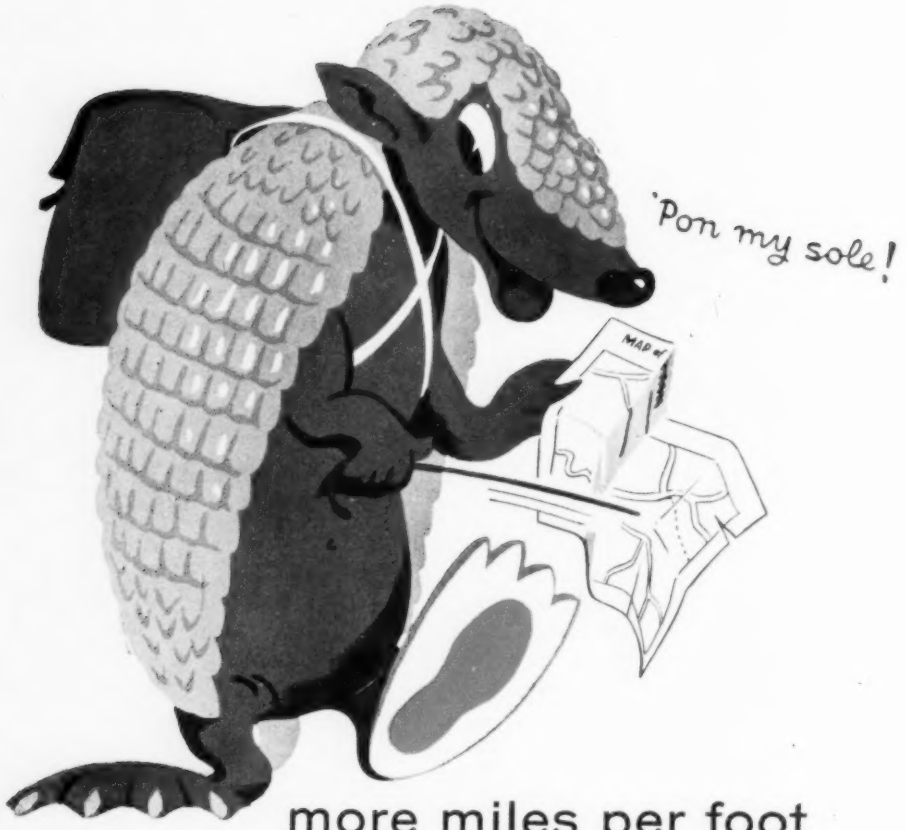

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'Soluble Zinc Sulphide' in Reclaim

EXPERIMENTAL WORK ON EFFICIENCY OF SULPHUR CROSS-LINKING

By W. E. STAFFORD, ARIC, FIRI, G. MELLOR, BSc, ARIC, and B. H. ARMSTEAD, ARIC.
Rubber Regenerating Co. Ltd.

ARMSTRONG, Little and Doak[1] were amongst the first to correlate the formation of zinc sulphide and the efficiency of sulphur cross-linking in NR vulcanizates. Later, Adams and Johnson[2] demonstrated that 'reversion' involved degradation which still further increased the sulphide sulphur content. These authors conceded that little was known of this degradation reaction, but suggested that it might arise from the presence of hydrogen sulphide.[3] Stafford and others[4] drew attention to the characteristic high sulphide sulphur contents of NS, SBR, and butyl reclaims, no doubt arising from the prolonged thermal treatment usual in conventional reclaiming processes.

N. Bergem[5] heated mixtures of zinc oxide, sulphur and stearic acid in a matrix of high molecular polyisobutylene and in sharp contrast to similar mixtures in NR obtained very little sulphide. From thermodynamical considerations, E. C. Bott[6] concluded that, whereas under normal curing conditions direct reaction of zinc oxide and sulphur was excluded, with hydrogen sulphide this might go to completion. Thus, sulphide sulphur appears to be fundamentally linked with sulphur vulcanization, reversion, and 'devulcanization'.

In 1957, one of us[7] pointed out that, using the solution method for the determination of total fillers in reclaim (BS 903:1950: Pt. 3, Section 3.3, page 38), there was a wide discrepancy between the zinc sulphide in the fillers recovered by filtration of the rubber solution, and that prior determined by the method described in BS 903:1950:Pt. 3, Section 3.5, page 39. Most of this sulphide was found to be in the solution after filtration through a No. 42 Whatman paper, *i.e.*, it appeared to be largely soluble in a mixture of dichlorbenzene and carbon tetrachloride. In 1959, V. L. Burger[8] drew attention to the apparent solubility of this zinc sulphide in certain organic solvents and suggested that it might exist in combination with stearic acid and in the thiol form, namely,

$$Zn<\begin{matrix}SH\\ Stearate\end{matrix}$$

Experimental Work

The work recorded here is of a preliminary nature. It is designed to examine certain reclaims and vulcanizates for the presence of significant amounts of the zinc compound suggested by Dr Burger. A literature survey has so far yielded no reference to it, nor to any homologues of the form:

$$C_nH_{2n-1}COO\diagup\!\!\!\!\diagdown^{Zn}\!\!\!\!\diagdown\!\!\!\!\diagup SH$$

For the purposes of experiment, the following compounds were mill mixed and treated as stated.

	R	*R*1	*R*2
Smoked sheet	100	100	100
Sulphur	6	9	9
Zinc oxide	6	3	3
Stearic acid	2	—	11
Treatment:	Vulcanized 6hr. at 141° C.	Vulcanized 6hr. at 141° C. Cured stock reclaimed by heating for 16hr. at 205° C. in water. Well washed, dried and milled.	

Mix R was prepared with the object of determining whether the zinc sulphide in this vulcanizate showed the 'solubility' in organic solvents already shown by the sulphides in reclaims.

The compound suggested by Dr Burger would be comprised of 8.38% sulphur, 17.02% zinc, 0.26% hydrogen and 74.34% stearic acid.

Compound R1, having no added stearic acid, will not permit the formation of any significant quantities of this zinc thiol compound and hence may show little 'soluble sulphide'.

Compound R2 contains adequate stearic acid for the potential conversion of the whole of the added zinc oxide to the thiol sulphur compound. It was planned to determine the ratios of zinc, sulphur and stearic acid present in the filtrate from the separated total fillers and to compare them with those requisite in this thiol compound.

Analytical Procedure

After acetone extraction, sulphide was determined in the resultant rubber by the standard method already cited, *i.e.*, treatment with HCl and absorption of H_2S in cadmium acetate solution, and with R2, the zinc extracted by acid boiling was estimated by titration with standard potassium ferrocyanide. With reclaims R1 and R2, stearic acid was determined in the acetone extracts. Sulphide sulphur in the fillers was determined by the BS procedure already cited, and zinc, sulphide, and stearic acid in the filtrate from the said fillers was estimated. The fatty acid content in reclaim R1 deducted from that of R2 was taken as being indicative of that remaining of the original 11 parts added in the preparation of Mix R2.

Analytical Results and Observations

All results are in parts per 100 smoked sheet. (See table below).

Comments

The results on Vulcanizate R prove that cured rubbers, as distinct from reclaim, also show this 'sulphide solubility, *i.e.*, 0.70 parts. Reclaim R1, containing no added stearic acid, would require some 8.25 parts if all sulphide sulphur was present as $Zn<\begin{matrix}SH\\ Stearate\end{matrix}$ The naturally occurring fatty acids in smoked sheet would not provide this requisite quantity. With reclaim R2, 10.52 parts of the original 11 parts

	Vulcanizate R	*Reclaim R1*	*Reclaim R2*
Acetone extract	6.67	10.08	21.62
Sulphide sulphur	0.92	0.93	1.16
Stearic acid required if all sulphide sulphur present as $Zn<\begin{matrix}SH\\ Stearate\end{matrix}$	8.16	8.25	10.29
Zinc combined as sulphide, *i.e.*, present in acid solution after sulphide sulphur extraction	—	—	2.27
Stearic acid in acetone extract	—	0.67 (as stearic)	11.19 (11.19 − 0.67 = 10.52 of original 11 parts added)
Sulphide sulphur in total fillers	0.18	0.14	0.13
Sulphide sulphur in dichlorbenzene and carbon tetrachloride filtrates from above	0.70	0.75	1.01
Stearic acid in above filtrates	—	—	Trace only
Zinc in above filtrates	—	—	1.85 (90% theory based on sulphide sulphur)

of stearic acid remain in the acetone extract, whilst the extracted rubber contains an equivalent of 1.16 sulphide sulphur. Small losses of stearic acid consequent of reclaiming could be expected in R2, which combined with the virtual absence of fatty acids in the filtrate containing the soluble sulphide, excludes the possibility of the presence of any significant ratios of the compound $Zn<^{SH}_{Stearate}$

This work does not preclude, however, the formation of this latter compound as an intermediate, since only end products were examined. Moreover, it is apparent that some 94% of the zinc oxide originally present in Mix R2 is contained in the reclaim R2 as sulphide. Since it was well established that maximum sulphide sulphur requires prolonged heating, *e.g.*, reclaiming, it is probable that reaction to stearate preceded decomposition to sulphide.

The higher sulphide content of reclaim R2 over R1 can be attributed to the presence of excess stearic acid in Mix R2, and this is in agreement with similar results for vulcanizates reported by N. Bergem (*loc. cit.*, page 120/21).

Zinc sulphide is well known in the colloidal state[9, 10] and its formation in a solid environment would inhibit crystal growth. The conditions operating during vulcanization or reclamation of rubber would favour the formation of a molecular dispersion which would pass through a fine filter paper.

Acknowledgment

Thanks are due to the directors of The Rubber Regenerating Co Ltd. for permission to publish this paper, which forms a part of our studies in reclaim development.

REFERENCES

[1]Armstrong, Little and Doak, *Rubber Chem. & Tech.*, 1944, **17,** 788.
[2]Adams and Johnson, *Ibid.*, 1953, **26,** 741.
[3]Craig *et al.*, *J. Polymer Sci.*, 1952, **8,** 321.
[4]Stafford *et al.*, *Rubber J.*, 1957, **132,** 576.
[5]Bergem, 'Contributions to the Theories of Vulcanisation', 1948, p. 133.
[6]Bott, *Trans. I.R.I.*, 1940, **16,** 35.
[7]Stafford, *Rubber J.*, 1957, **133,** 199.
[8]Burger, *Rubber Chem. & Tech.*, 1959, **32,** 1452.
[9]*Bull. Chem. Soc. Japan*, 1942, **17,** 309.
[10]*J. Phys. Chem.*, 1929, **33,** 605.

Five Years for Engineer

An employee of the Andre Rubber Co. recently tried to sell his company some of their own tools.

Charles James Smith, charged with procuring the delivery of traders' credit notes to the value of £3,162 by Andre to J. F. Kemp and Co. with intent to defraud, was sentenced at the Surrey Quarter Sessions to five years' imprisonment.

Joseph Francis Kemp, a company director, was found not guilty of conspiring with Smith.

The prosecuting counsel had said that the tools were invoiced to the Andre Rubber Co., Kingston-By-Pass Road, Surbiton, where Smith was a project engineer, as having been made by J. F. Kemp and Co., when in fact they had been made in Andre's own premises.

Polythene Fruit Box

An almost indestructible container for transporting fruit and vegetables is being developed by the National Federation of Fruit and Potato Trades.

Made of polythene, it has been examined by the federation's containers committee. The committee suggested modifications and members all over Britain put forward other ideas for improving the box.

The new design will have strong corner posts for stacking, and is claimed to be so strong that a tractor can be driven over it on soft ground without damage.

Neoprene Cuts

Du Pont de Nemours International S.A. has announced price reductions on two important types of neoprene synthetic rubber.

From August 1 1961, the price of neoprene WHV will be reduced by 2 cents a lb. (4.4 cents per kilo). The price of neoprene latex 842-A will also be reduced by the same amount for tank car quantities.

Dr Russell A. Kurtz, marketing manager, said that the price reductions were made possible by improved manufacturing techniques.

Steel and Rubber

A seed or fertilizer drill tube, made of rubber strengthened with an integral spiral steel spring, is being produced by Tempered Rubber Components Ltd. of Sheffield.

It is said to be highly flexible and will not kink under pressure, and has a perfectly smooth bore. The steel spring, which is the only metal part, is embedded in the rubber itself so that it is not exposed either internally or externally.

Lintafoam Tie-up With US Firm

LINTAFOAM Industries Ltd. has signed a foamback agreement with Reeves Bros. (Inc.) of New York. A statement says that 'the two companies will join together to exploit by manufacture, sale and licence, the patents and know-how of both companies in the field of textile polyurethane foam laminations'.

These arrangements will apply through the UK, Eire, Europe, South Africa and the Commonwealth, excluding Canada.

To exploit the agreement a new company will be formed which will work 'in close co-operation' with United Merchants and Manufacturers (UK) Ltd., which at present sells Reeve's Curonized fabrics. The company will be based in High Wycombe, and its managing director will be G. W. Stevens, sales director of Lintafoam.

Dunlop Arrangement

Lintafoam states that 'supplies of Curon grade foam for lamination will be made available to licensees for the Continental market under exclusive arrangements reached with Metzeller Gummiwerke AG of Menningen, Germany, and for the UK and other countries by the Dunlop Rubber Co. Ltd.'

To deal with the increased production required Lintafoam has acquired a factory at Droylsden, near Manchester, which at present is being equipped with specialized machinery and thermo-lamination plant ready for mass production in August.

Agent for Polyflex

Kemitype Ltd., of 8 Chase Road, Park Royal, London, N.W.10, has been appointed a non-exclusive UK sales agent for Polyflex biaxially oriented polystyrene film and sheet marketed in Britain by Monsanto Chemicals Ltd.

Kemitype Ltd., one of the Chambon group of companies, was previously UK agent for the range of packaging films manufactured by Kalle of Germany.

MoH Contract

The General Rubber Goods Division of the Dunlop Rubber Co. has obtained from the Ministry of Health contracts worth more than £54,500 for supplying hot water bottles, jaconet, batiste and three qualities of bed sheeting.

The contracts are for a twelve month period, and supplies will go to hospitals throughout the UK.

Intex Latices

All latices produced by the International Synthetic Rubber Co. Ltd. of Hythe, will now be known under the group name of Intex.

The company's 62A latex has been renumbered 100.

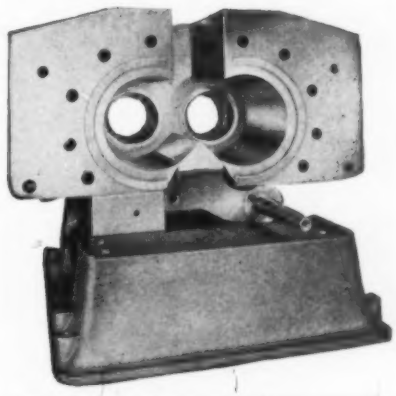
NEW BANBURY* DROP DOOR DELIVERS 3 BIG BENEFITS

- *leakage prevention*
- *shorter cycles*
- *almost instantaneous discharge*

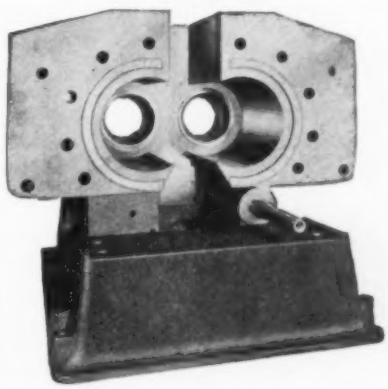
Here's a new development in Banbury mixer design: the hydraulically operated drop-door . . . now available as an optional feature on all new production-size machines. The drop-door design does away with a source of leakage and contamination which cannot be avoided in sliding-door design. Clearances which permit some leakage are required for sliding action which is not the case with the drop-door. The new door is hinged, and the surfaces of the door edge and the bottom of the mixing chamber are tapered so that a good line of contact is obtained. The door is leakproof throughout a full period of normal wear and there are no tailings left to contaminate a succeeding batch. The new door has been clocked as low as eight seconds for opening, discharge and closing—more than twice as fast as a sliding door. As a result, the overall mixing cycle is reduced. And, in short-cycle operation, discharge time is in better balance with actual mixing time.

Faster discharge, besides cutting cycle time, is particularly advantageous when formulas require almost instantaneous discharge after pre-determined temperature is reached. With some, a few seconds lag will permit the stock to set up in the mixing chamber.

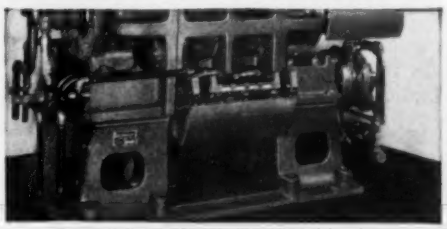
* ***Banbury is a registered trade mark in many countries throughout the world***



Chamber of Banbury with drop door in closed position



Drop door partially open



Angular view of drop door in open position

Size 11 D-High Pressure high horsepower uni-drive Banbury Mixer with drop type discharge door.

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STABILIZERS FOR PVC — PART 4

Tin Compounds and Mixtures

MIXED STABILIZERS COVER WIDE RANGE OF USAGE

By W. S. PENN, BSc.

This is the fourth of a series of six articles on pvc stabilizers, the object of which is to help users to choose from the ever-increasing number of stabilizer systems available on a technological basis. The classification of stabilizers referred to appeared in *RPW*, July 1, 8

THE remaining three groups of stabilizers in the classification are covered in this article. Group III includes the tin stabilizers, mainly the 'pure' chemicals. Proprietary materials are covered in a later article.

The Group IV stabilizers are a miscellaneous collection but include some valuable types. The most important are the epoxidized oils and esters. Also very important are the chelators, mainly various phosphites which are so frequently used with the epoxy products in the mixed stabilizers of Group V. Finally, it is proposed to consider the UV light absorbers of which the useful types have only recently been recognized but which are already making an important contribution to pvc technology.

The last group is one which is developing at a remarkable pace. The combinations of barium, cadmium and zinc soaps and salts are now large in number and have some most valuable properties. They are considered briefly in the present article but a much larger number is included in the article on proprietary materials since so many of the mixtures are disguised under proprietary names.

Tin Stabilizers

The tin compounds are perhaps the most remarkable of all stabilizers, and although initially expensive, the small amounts of some types used may well make them competitive. They should be used wherever the greatest clarity coupled with good heat resistance is required. They may often be used as the sole stabilizer, the amount required rarely exceeding 2.0phr.

Although tin compounds are used alone they are often sold mixed with other products such as antioxidants. They are even blended with mixtures of barium and cadmium compounds to obtain the synergistic effects of the latter. Such mixtures are considered under proprietary products.

The properties of tin stabilizers make them particularly suitable for rigid compounds where they are widely used. They also have better light-resisting properties than the barium/cadmium types and are to be preferred where this characteristic is likely to be of importance.

Some tin stabilizers tend to cause sticking during processing and careful adjustment of lubricant is necessary. Staining of lead compounds is obtained with thio tin compounds so that the combination of the two should be avoided.

Four specific stabilizers are described below which are available commercially. All are toxic except one which is therefore a very valuable addition to the range.

Dibutyl Tin Dilaurate

This stabilizer gives very clear stocks and has been used for clear plasticized hose. It has good light stability and enough heat stability for normal operations. For similar reasons it is satisfactory for clear sheet again provided the processing temperatures are not too high. It can also be used for clear plastisols and organosols.

The stabilizer has a reasonable lubricating action and therefore the lubricant may either be reduced or eliminated. About 2.0phr. is required.

Dibutyl Tin Dimaleate

This material when sold as a stabilizer is strictly speaking a polymeric form of di-butyl tin maleate. It may be used as a reasonably effective substitute for thio tin compounds when sulphur staining is to be avoided.

The quantity of the stabilizer required varies between 0.5 and 2.0phr. The DBTM, however, is often used in a synergistic mixture with epoxy materials and certain cadmium/barium combinations. It is considerably superior to DBTL as a heat stabilizer and is thus particularly suitable for unplasticized injection moulding compounds used at temperatures up to 200°C. DBTM also has good light stability.

The stabilizer has two minor defects. One is a tendency to exude at high concentrations and the other is a lachrymatory effect.

Thio Tin Stabilizers

These materials give maximum heat stability. They also give very clear compounds and consequently are used extensively for clear rigid extrusions and sheets. In transparent plasticized sheet employing large quantities of phosphate plasticizer, it is also advisable to use thio tin types.

The quantity used is usually about 2.0-3.0phr in rigid compositions with less in flexible types. They have little or no lubricant properties so that a lubricant needs to be added.

Di-N-Octyl Tin Salts

All tin compounds appear to be toxic with the exception of the di-n-octyl tin salts. This view was stated in the British Journal of Industrial Medicine,[1] and has now received wide acceptance.

Such a product (sold as Stanclere 80 by Pure Chemicals Ltd.) satisfactorily meets the requirements of the British Plastics Federation Non-Toxicity Sub-Committee. The material is quite versatile and has a performance near to that of the thio-tin compounds for plasticized and unplasticized compounds and all types of polymer.

Such a product clearly opens the way for its use in clear rigid tubes for milk hose, beer hose and like products.

Organic Based Compounds

The only feature which these stabilizers have in common is that they are all based on organic compounds. The three main types to consider therefore are the epoxy stabilizers, the phosphite chelators and the benzophenone UV light absorbers.

Neither vegetable oils, nor the alkyl esters of their fatty acids are sufficiently polar to be particularly compatible with pvc. However, if the constituent glycerides with varying types of unsaturated fatty acids (mainly stearic, oleic and linoleic) are epoxidized (*i.e.* the double bonds are converted into epoxy groups) then much greater compatibility results. Both the oils and esters have plasticizing and stabilizing properties.

The glycerides and esters although not identical are nearly so with respect to heat and light stability. In many

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ways this is surprising since the glycerides contain 50% more oxirane oxygen than the esters. There is a slight superiority with heat resistance, however.

The most common chelators are triphenyl phosphite and trisnonylphenyl phosphite. They are not stabilizers in their own right, but nevertheless assist effectively in the presence of other stabilizers notably the barium/cadmium types.

The best known UV light absorbers are the benzophenones of which 2-hydroxy-4-methoxybenzophenone and 2:2'-dihydroxy-4-methoxybenzophenone are commonly used. They are sold as Cyasorb's UV 9 and 24 by Cyanamid of Great Britain Ltd.

All of the above products are considered in detail below.

Epoxidized Oils and Esters

These materials, although they may be used alone (10–12phr) under comparatively mild conditions, are normally employed as highly efficient subsidiary stabilizers.[2] They allow the use of certain stabilizers (aluminium and zinc stearates for example) which might not otherwise be used, but even so, care must be exercised in using them since although they can achieve remarkable results in certain cases, they are deleterious in others if not used correctly.

It should be stressed that the epoxy stabilizers are not 'precise' chemicals but vary from supplier to supplier, although they have similar general properties. These may be listed as follows:

(a) They are plasticizers as well as stabilizers.

(b) They are non-toxic.

(c) They have little lubricant properties. This can be useful since it not only overcomes the obvious difficulties in printing, etc., but it enables 'controlled' lubrication to be employed.

(d) The compounds resist extraction by all types of solvents and they do not migrate or cause 'marring'.

(e) They provide compounds of good colour, particularly with phosphates, although it is difficult to avoid slight colour with many phthalates.

(f) They have a comparatively low specific gravity.

(g) They do not stain with sulphur compounds.

(h) They are neutral at all times and therefore can be used with compounds in direct contact with metals such as insulation on tinned copper wires. They may allow the use of pvc on bare copper wires, since many conventional stabilizers cause slight corrosion.

Synergistic Mixtures

Although epoxy stabilizers have fairly general application they are finding their greatest use in conjunction with the synergistic mixtures. They considerably improve barium/cadmium combinations. Now if zinc and aluminium stabilizers are used alone in non-toxic mixtures, not only are they weak but they may cause decomposition. They may behave as Friedel-Crafts catalysts and cause degradation of pvc compounds almost with explosive violence. The epoxy resins form complex compounds with them and thus prevent the reaction from taking place. The normal method of use is to replace 5.0–7.0 phr of the conventional plasticizer with the epoxidized plasticizer/stabilizer.

The fact that the epoxy stabilizers are liquid is usually very useful from the point of view of incorporation. This particularly applies in plastisols and organosols. The epoxy stabilizers are also sometimes used with tin stabilizers.

It was stated earlier that some epoxy compounds can be used as the sole stabilizer in relatively mild heat and light conditions. When this is done up to 50% of the conventional plasticizer can be replaced. Some of the stabilizers, however, react with hydrochloric acid to give products which are incompatible with pvc. Such products may sweat out after sufficient exposure to heat and light so that the user should be quite clear about the properties of the products he is using. If the stabilizer is one of these 'restricted' types no more than about 20% of the conventional plasticizer or more than 5% of the combined polymer and plasticizer should be replaced.

The cost of the epoxy stabilizers appears to be relatively high. However their use only costs the difference between their cost and that of the conventional plasticizer which is partially replaced. If then the low SG is taken into account and the higher processing temperatures and speeds are considered, it may well be that the overall cost is lower. Since also the quantity of conventional stabilizer can also be reduced when epoxy stabilizers are employed, their use can easily reduce the costs of compounds.

Chelators

These important materials are now widely used, since they serve several useful functions. The chelators, which are almost always aryl or alkyl phosphites, form complexes with metallic salts which thus prevent a catalytic effect in the promotion of degradation. The chelators also minimize colour development and inhibit 'cloud' formation.

The use of a chelator means that the quantity of primary stabilizer can be reduced. This is because the materials behave synergistically and the primary stabilizer can be reduced by more than the quantity of primary stabilizer removed. The feature can be very important in some rigid compounds where the expensive tin stabilizers may well be involved.

The chelators, used alone, are not effective as stabilizers. They must be used synergistically with primary stabilizers which can include lead types, other metallic salts and soaps, epoxy types or organotin compounds.

The quantity used varies according to the severity of the conditions expected. However, the maximum which needs to be used is 1.0phr. Sometimes as little as 0.1% will be satisfactory but more frequently a compromise of say 0.5% would be wiser.

The most common chelator is probably triphenyl phosphite. However, there are a number of proprietary materials on the market the composition of which is not disclosed. Polygard, sold by the Rubber Regenerating Co. Ltd., is tri (nonylated phenyl) phosphite which is probably a constituent of some other chelators.

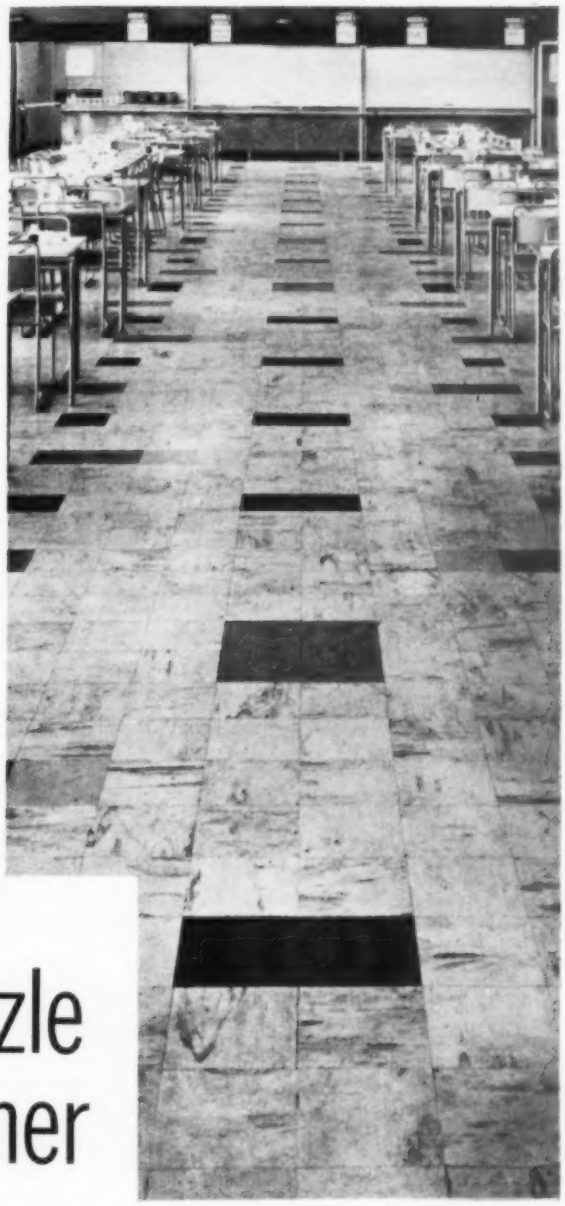
The addition of a chelator is sometimes assisted by dispersing it in an equal quantity of the plasticizer.

UV Light Absorbers

When pvc is exposed to UV light it soon deteriorates and becomes brittle as well as yellowing. If a chemical is added which will absorb light in the 300-400mμ region then these reactions will be stopped or at least delayed for a considerable period.

The benzophenones[3] are at present some of the most useful chemicals to achieve the desired effect but the chemical nature of the substituent is of the greatest importance. For example 4-hydroxybenzophenone is a weak absorber and transmits over 90% UV light at a given concentration, while under the same conditions 2-hydroxybenzophenone only transmits about 25%. The introduction of a 4-methoxy group effects yet another improvement and no doubt there is still much room for development. The trouble is that the further the move in the amount of UV light absorbed the more yellow the compound becomes.

As with stabilizers, it is possible to list the requirements of a UV light absorber. (1) The material must obviously have high UV light absorption. (2) The absorber itself must have good light stability which the 2-hydroxy derivative does have. (3)



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It must be stable to heat, for both processing and subsequent usage. (4) It must have quite a number of other properties which are obvious for this type of material. For example the material must be compatible with pvc and its copolymers and compounding ingredients; it must be, where necessary, non-toxic and have as little colour as possible.

The first product found suitable was 2-hydroxy - 4 - methoxybenzophenone sold as Cyasorb UV9. It has high stability to heat and light at least to 200°C. and even more. In weatherometer tests ordinary stabilized compounds have lasted 1,000 hours but when additionally stabilized with UV9, the life is extended to 5,500 hours. Quite small quantities are required although there is increasing protection with greater quantities. About 0.5phr is normally sufficient. In appearance the material is a light yellow powder with an SG of 1.324.

Cyasorb UV24, 2,2′-dihydroxy-4-methoxybenzophenone has also been found suitable for use in pvc. The material is a pale yellow powder with a melting point of about 69°C. It is incorporated by mixing in a little plasticizer. Even smaller quantities of UV24 are required than UV9, and as little as 0.2phr is very effective. The material was evaluated in a compound of the following composition:

PVC	100
DOP	50
Ba Cd laurate ..	2
Aryl phosphite ..	1
UV24	0.2

The test was carried out in a Fade-Ometer and the samples were exposed until spotting began. The results obtained are given below indicating the efficiency of the UV light absorber.

	Time for Spots to Appear (hr.)	
No. of Spots	*Unprotected*	*Protected*
First spot ..	140	680
Tenth spot ..	220	1,800

Mixed Stabilizers

The use of synergistic mixtures is one of the most important developments in stabilizer technology.[4] In fact, some soaps, as already described, cannot be used at all by themselves, but are most effective with other stabilizers.

Combined systems can be made in two ways. Either the individual stabilizers can be mixed together, or the soaps, such as barium/cadmium laurate are co-precipitated during manufacture. This appears to result in a far more efficient mixture.

Probably most of the mixed stabilizers used today are sold under proprietary names. It is, however, useful to consider the type of mixtures which have been found successful. A summary of the simple mixtures used was given in Article 1, but is repeated here for convenience:

Barium/cadmium laurates, ricinoleates, and stearates.

Barium/zinc stearates and laurates.

Strontium/zinc laurates.

Many other combinations have been tried with several metals and fatty acids, oleates sometimes being used. Various reasons for the use of these combinations have been given previously.

At the present time the tendency is to use more complex mixtures than the above. Much research has been conducted by supplier firms and their products may well include a barium/cadmium organic salt, a zinc organic salt, an antioxidant, a UV light absorber, a chelator and an epoxy compound.

One of the biggest defects of stabilizer mixtures is the tendency to plate-out. This has been attributed to metallic soaps, hence the tendency towards metallic organic salts avoiding the fatty acid derivatives.

Some combinations of stabilizers have already been given but the series below traces the development of synergistic mixtures to the most modern, although all are probably used to at least a slight extent.

(1) Barium stearate — 2.5phr, cadmium stearate — 0.5-1.0phr, epoxidized oil — 5.0-7.0phr. Heat and light stabilizer specially for phosphate plasticized stocks.

(2) Barium stearate — 2.75phr, zinc stearate — 0.25phr, epoxidized oil — 5.0-7.0phr, triphenyl phosphite 1.0 phr. Non-staining in sulphur compounds. Note the use of the 'epoxy' and chelator. An antioxidant and UV light absorber would improve the combination.

(3) Lead stearate — 1.0phr, strontium laurate — 1.0phr. A good all-round stabilizer included to show that lead soaps can also be used in synergistic mixtures.

(4) Calcium stearate — 2.75phr, zinc stearate — 0.25phr, epoxidized oil — 5.0-7.0phr. A good combination which is non-toxic.

(5) Co-precipitated barium/cadmium laurate — 2.0phr, triphenyl phosphite — 1.0phr. For suspension type polymers with phthalate plasticizers.

(6) Co-precipitated barium/cadmium ricinoleate — 3.0phr, triphenyl phosphite — 1.0phr. For suspension or emulsion type polymers with phthalate plasticizers.

(7) Co-precipitated barium/cadmium laurate — 2.0phr, epoxidized oil — 5.0phr. For suspension or emulsion type polymers with phthalate or phosphate plasticizers.

(8) Co-precipitated strontium/zinc laurate — 2.0phr, epoxidized resin — 5.0phr. For suspension or emulsion type polymers with phthalate or phosphate plasticizers.

In all of the above combinations where barium/cadmium soaps are used the ratio is frequently 2:1. The following general points should be noted.

(1) The addition of zinc compounds to barium/cadmium combinations (a) helps eliminate sulphur stain and (b) improves heat resistance although if above 0.5phr the heat resistance may deteriorate.

(2) Chelating agents (a) delay initial yellowing and (b) improve clarity or eliminate cloud formation.

(3) Stearic acid is used with barium/cadmium salts to (a) provide lubrication and (b) give additional stabilization. Where carbonate fillers are used add an extra 0.1 parts stearic acid per eight parts of filler used.

(4) Epoxy compounds are useful (a) particularly where anti-static compounds are used and (b) in non-toxic combinations.

(5) Some solid barium/cadmium soaps give a slight haze in compounds which, however, usually disappears within 24 hours on standing.

Conclusions

Three quite distinct types of stabilizers have been described in the present article. Between them they cover nearly every requirement likely to be met with in pvc stabilization.

The organotin compounds are expensive and yet give the highest possible clarity in rigid and flexible vinyls. The thiotins couple this with exceptional heat resistance.

The epoxy compounds are today used with most synergistic mixtures although the quantity used should be watched from the point of view of initial yellowing and exudation of reaction products. Chelators are also general purpose materials and supplement epoxy compounds in many combinations. The UV light absorbers have been shown to be extremely valuable materials and should always be employed where pvc compounds are likely to be used extensively out-of-doors.

The mixtures of metallic salts/soaps cover the widest possible range of usage. There is a combination for most purposes and the scope for future research is enormous.

REFERENCES

[1] Drs. Barnes and Stoner, *British Journal of Industrial Medicine*, March 1958.
[2] T. C. Moorshead, *Plastics*, August 1957.
[3] W. B. Hardy and R. A. Coleman, Proceedings of the Perkin Contennial, 1856-1956, The American Association of Textile Chemists and Colorists, Textile Research Institute, pp. 69-75 (1957).
[4] W. G. Vennels, *Trans. Plast. Inst.*, **23** (51), 44-60, 1955.

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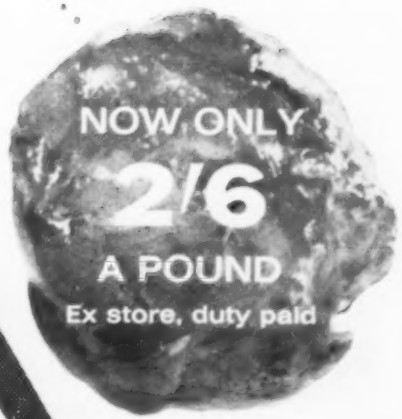

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Tyre Testing on Vehicles

DUNLOP TEST FLEET COVERS 1¾m. MILES A YEAR

TYRE tests on vehicles fall into two main groups — those performed on the open road and those carried out under specialized proving ground or laboratory conditions. In both cases, the results may be considered authentic, the proving grounds simulating specialized road conditions in a way which facilitates repeated tests under close control. Facilities used by the test fleet of the Dunlop Rubber Co. Ltd. include proving grounds at Fort Dunlop and the Motor Industries' Research Association, Lindley, disused airfields near Wolverhampton and Coventry, the Fort Dunlop chassis laboratory and specially chosen road routes at home and abroad. The test fleet comprises some 50 vehicles, including motor cars, lorries, tractors, a motor cycle and a passenger coach.

Fort Dunlop Proving Ground

Completed towards the end of 1955, the proving ground comprises a representative selection of widely differing road surfaces. These include a smooth asphalt skid-pan, used for wet skidding tests, noise generation tracks and an inclined bank on which can be studied the reaction of tyre equipment to a constant lateral force.

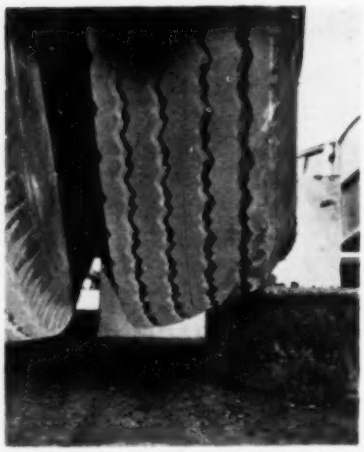
A recent innovation is the use of photo-electric cell units to record exact vehicle speeds during 'straight-ahead' braking tests. Having accelerated to the requisite speed on the approach road, the driver applies maximum braking and, with all four wheels locked, passes between a photo-electric cell and its light source. Momentary interruption of the light beam trips a time recorder, which is stopped again when the car interrupts a second photo-cell beam 8ft. further on.

From this timing the exact initial skidding speed of the vehicle is calculated. Set against the stopping distance, this forms the basis of direct comparison between tread designs. Since the friction coefficient of the wet road surface remains constant, the gripping properties of each tyre pattern or tread compound may be accurately assessed. Tests of this nature were used in developing a suitable high hysteresis tread compound for the company's Elite tyre, introduced during 1960.

'Kerbing' damage, caused by careless parking or running through narrow streets, is common in commercial vehicle operation. This damage takes the form of tearing and splitting around the outer rib and shoulder area of the tyres. In order to evaluate the resistance of giant tyre patterns to this damage, two 4ft. arcs of kerbstones have been laid out so that the tyres on one side of a vehicle travelling straight ahead will strike the kerbs tangentially, one after the other. The vehicle is driven repeatedly over the kerbs, the tyres being examined at regular intervals. This procedure has been of considerable value in enabling the designers to develop shoulder ribs capable of withstanding kerb damage.

Since the war, considerable improvements have been made in vehicle design and sound-proofing, with the result that present-day motor cars run much more quietly than their predecessors. While tyre 'pattern whine' is no longer a serious problem, it occasionally becomes necessary to investigate the part played by tyres in transmitting another noise phenomenon, known technically as 'road-excited body resonance' — more commonly 'road-roar'.

This is assessed by allowing the car to 'coast' in turn along specially surfaced tracks of granite setts and tarred chippings, whilst sound recordings are made with equipment installed inside the vehicle. Tape recordings made in this way are studied comparatively with the aid of sound analysis equipment, thus eliminating the fallibility of the human ear. Transmission of 'road thump' may also be assessed over a stretch of concrete roadway, interspersed with prominent expansion joints.



Kerbing test in progress with a pair of Highway tyres

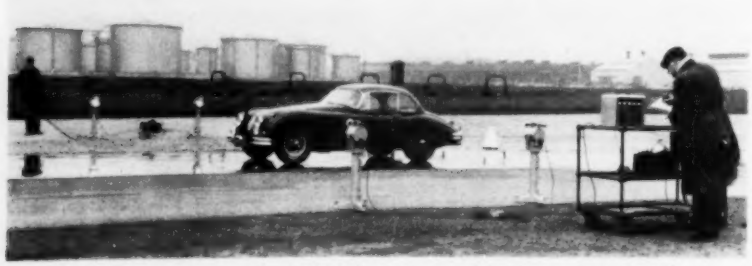
In addition to its value in tyre development work, the proving ground is frequently used in co-operation with vehicle manufacturers, to solve suspension or noise generation problems. The skid-pan is also used by the police for specialized tuition and demonstrations.

Airfield Proving Grounds

At Halfpenny Green, near Wolverhampton, Dunlop leases a disused airfield where 'dry' roadholding and braking tests are carried out. Several other techniques are in current use, one of which is known as the 'wander' test.

Motorists are well acquainted with the momentary pull on front wheels when crossing painted white lines at a slight angle. Temporary loss of steering control may be experienced at very high speeds. At Halfpenny Green an unusually thick, profiled line has been laid down over a distance of some 200yd. The effects of this raised line on tyre grip and steering control may be studied closely, the objective being to develop a tyre shoulder which will climb the ¼in. profile in 'caterpillar' style, at the same time maintaining maximum steering control. The results of extensive wander tests are embodied in the shoulder profile of the company's latest Road Speed tyre, the RS 5.

Another disused airfield at Honiley,



Measuring locked-wheel skidding speeds with photo-electric cells

between Kenilworth and Coventry, is sometimes employed to assess heavy vehicle road-holding on wet surfaces. It was also used during development of the company's Stand-by wheel.

Road Testing

Dependent upon individual test objectives, the test fleet vehicles may use one or more public highway routes, selected on account of their unusually abrasive surfaces, fast, winding or hilly stretches. Occasionally it is necessary to send teams of drivers and observers abroad — to Scandinavia for example, where low temperature test programmes have been implemented — to Austria where snow conditions remain constant for considerable periods — to Morocco for main and mountain road endurance tests at high temperatures and to many other overseas territories where special conditions prevail.

In order to ensure accurate and consistent results from road testing, a standard test procedure has been devised and is rigidly practised. For most UK tests a pair of identical vehicles is used, each equipped with a set of tyres which may be of identical or quite different construction and design. To eliminate variations in tyre performance which may result from differences in driving technique, the following procedure is observed:—

1. In the case of two vehicles undertaking a round trip of 200 miles, vehicle 'A' leads for the first 50 miles, after which it takes up the rear position.
2. At the halfway mark, the drivers exchange vehicles, 'B' retaining the lead.
3. After 150 miles, vehicle 'A' resumes the lead for the remainder of the journey.

By this means, not only is the element of human difference eliminated but the extra effort incurred by the rear vehicle in keeping pace with the leader is shared evenly between the two. Thus, since each set of tyres had undergone the same treatment, any margin in performance will be due solely to tyre characteristics.

As an aid to the compilation of more detailed test data, the fleet is currently being equipped with 'Tachograph' instruments, which provide a continuous and permanent record of speeds, mileages and running times. The Tachograph is fitted as standard equipment on all new vehicles.

Chassis Laboratory

The Dunlop Chassis Laboratory consists primarily of a large steel platform on to which a motor car may be driven and secured. The wheels may then be rotated at any speed up to 150mph, by means of electrically driven drums underneath the vehicle. The value of this installation lies in the fact that behaviour of the chassis, suspension and tyre equipment can be studied at close range while the vehicle itself is stationary, and the cause of any particular effect accurately diagnosed.

Using a high speed camera, sound recording and other apparatus, it is possible to detect vehicle reactions which cannot conveniently be observed or recorded while the vehicle is travelling over a public highway or proving ground. These facilities are also made available to vehicle manufacturers and have already yielded solutions to many otherwise intractable suspension and allied problems.

MIRA Proving Ground

Through membership of the Motor Industries' Research Association the company is able to make use of test facilities at Lindley, near Nuneaton, where the Association has its vehicle proving ground. Here, work consists mainly of roadholding, tread wear and speed tests on the various circuits. A representative of the company's tyre performance division is located at Lindley as a permanent technical adviser, whose duties include consultative guidance to MIRA members on tyre and wheel problems.

During 1960, some 30 Dunlop drivers (of whom 27 are members of the Institute of Advanced Motorists), have covered 1,685,405 miles in implementing a comprehensive and detailed test programme. The immediate value of some of this work may be seen in two recently introduced tyres, the Elite and the RS 5 Road Speed. Test schedules and annual mileages are steadily increasing, in order to keep pace with the demands made by designers and research divisions on the Vehicle Tyre Testing Team.

Checking tyre tread temperatures on a test fleet lorry after a high-speed run

Dunlop test motor cyclist lapping the MIRA Lindley high-speed circuit at 110mph

GRP for Lambretta

Lambretta Concessionaires expects to market shortly a new angular-lined glass-fibre sidecar for attachment to Lambretta scooters.

It is being manufactured at the Trojan factory at Croydon, Surrey, which is part of the Lambretta-Trojan organization.

Neoprene Cement Cut

Goodyear Tyre and Rubber Co. (GB) Ltd. has launched a new neoprene cement which shows a 'substantial reduction in price from its predecessor, without any loss in quality'. It is being marketed in pint and gallon cans.

VIEWS and REVIEWS

Talk, Talk, Talk

WE talk a lot in our industry. The Plastics Institute had a conference on Education and Training a few weeks ago, is to have another on 'Engineering with Plastics' on October 31 and November 1 next, and a third in March 1962 on 'Testing for Performance', while the British Plastics Federation is to hold a conference at Torquay in May 1962. In that month, too, there is the big Fourth Rubber Technology Conference organized by the Institution of the Rubber Industry, and the IRI is also to run a non-technical conference at Leamington in November 1962, with the intriguing title of 'The Background to Management Decisions'.

These all sound rather attractive, but they are becoming a little frequent. Indeed, so insatiable is our British appetite for organizing — and, presumably, for consuming — conferences, that there has been set up a Liaison Committee consisting of representatives of the IRI, the PI, the Oil and Colour Chemists Association, and the Society of Chemical Industry (Plastics and Polymers Group). Might not one or two of the members of this Liaison Committee be appointed the British representatives to an international co-ordinating committee, charged with similar functions and duties in the international sphere to those discharged by this committee in the British national sphere?

I notice that J. M. Buist, in his excellent contribution on the physics of the rubbers to the recently-published IRI Annual Report on the Progress of Rubber Technology remarks, 'It is increasingly difficult for the rubber scientist or technologist to keep abreast of all the work reported even in a narrow field. Detailed study of many of the papers presented at these two conferences shows that there is considerable overlap and even duplication of work being carried out in industrial and research association laboratories . . . in future much briefer reporting of overlapping and duplicated work should be encouraged'.

This sort of comment, which is increasing among our technologists, seems to me to demand two things: better planning and better reporting of conferences. One way of achieving the latter is by means of the expert summary, such as that of the Berlin Conference by Dr W. Wake in the American *Rubber Age*.

But planning is equally necessary. The plea for international co-ordination has several times been made here in this journal and in other journals overseas. Who will take the first step and call a conference on conferences?

The Nature of the Beast

We need to know more about the nature, characteristics, and functioning of conferences. Here, I am privileged to state my opinion either as a 'view' or a 'review' without being compelled to produce confirmatory data, but it would be unrealistic and inappropriate in a technologist if I did not confess that there is a need for research work to provide basic data on the value, methods, and organization of conferences.

Some pertinent and lively comments are made by Alexander King of OEEC, in the *Journal of Documentation*, Vol. 17, No. 2, June 1961, pp. 69-76, in an essay entitled 'Concerning Conferences'. He calls the conference 'one of the most remarkable phenomena of modern society' and says it is 'infectious and insidious', 'while it has reached real epidemic proportions in the USA and Western Europe, it is now to be found everywhere — ceremoniously in Asia, seriously in Africa south of the Sahara, importantly in Latin America, relentlessly behind the Iron Curtain. . . . As an off-peak support of the hotel industry it is to be found in every English spa and seaside resort . . . it is both a mark of the affluent society and a dim if vociferous striving towards world society'.

It is, he asserts, big business employing thousands of professional workers. It has its own rituals, 'such as the ceremonious and pompous introductory session . . . and the final mass participation in the framing of serious and platitudinous recommendations which seldom get further than the conference proceedings published long after as a memento for the conferences and as a prize for a few kleptomaniac librarians'. Lest you should think that such acid comments are typical of the whole paper, I hasten to add that they are rather to be regarded as pockets of low pH aimed at giving piquancy to the whole.

In fact, the author's next sentence is an extremely practical and important point. 'How seldom is it made clear what is to be the precise purpose of a particular conference, what type of conclusions should be striven for, and how these will be followed up'.

Kinds of Conferences

A conference may have one or more of seven main functions. The first, announcement of new knowledge, though often assumed to be, is actually seldom the main function of a conference. 'Most of the papers read are, in fact, published in greater detail in the normal scientific journals. . . .' Function number two, he claims to be much more realistic, the exchange of information and experience. 'For quickly developing specialized topics and especially for those in border-line fields between different sciences, discussion stimulates cross-fertilization of ideas and the transmission of information more quickly than the printed word'. The five others include: education, formulation of problems and situations, and fact-finding and reporting. 'A more conscious appreciation of the functions which a particular conference is designed to sustain can contribute greatly to its success'.

This is all very interesting and attractively presented but we need to know much more. Dr King is reviewing a report on an international conference on conference aims, methods, and social significance, and I have not had the advantage of seeing it. I gather, however, that it raises more questions than it answers. 'Many interesting points of view are discussed which should be considered seriously by all those who have to organize international conferences. . . .'

He concludes: 'We require more conferences on con-

COMMENT ON SCIENTIFIC AND INDUSTRIAL MATTERS

by **F. C. JENNINGS**

ferences. . . . We must have more understanding of the social processes involved and the social techniques that can be evolved. There is work, too, in formulating more clearly the objectives and functions of conferences, the effectiveness of different types in relation to communication, in studying the economics of conferences, large and small, in evaluating the importance (if any) and availability of proceedings, and above all in cultivating in conference organizers a conscious attitude towards the achievement of their aims'.

A Problem in Hysteresis

Will a rubber physicist or tyre technologist please give me some assistance?

The problem begins with a paper presented to the West Berlin Conference last October and published in *Rubber Age* for May 1961, Vol. 89, No. 2, pp. 269-282. It is by C. W. Sweitzer of the Columbian Carbon Co. and deals with the 'Effects of Lowered Structure' of carbon black on the reinforcement of rubber.

In the reinforcement of rubber by carbon black, three fundamental factors are now recognized: surface chemistry, particle size, and 'structure'. I recently dealt with the surface chemistry of reinforcement in reviewing another paper by Sweitzer and his colleagues; this is a study of 'structure'.

'Structure' in Carbon Black

I pause to insert a parenthesis deploring this usage of the word 'structure' because it is a debasing of a good English word of definite meaning. Its usage in this way is not clear — and indeed confusing — because it is now being given a quantitative significance which it does not basically possess either etymologically or semantically.

When will our scientists and technologists learn that they have a duty to use words as they use figures, with care, precision, and respect? If, by 'structure', they mean degree of aggregation, why not say so? In any event, what is actually measured is the amount of oil absorbed by a given quantity of the black in forming a paste. This oil absorption figure can be modified in several ways; Sweitzer and his colleagues report that whether it be reduced by grinding the black in a ball-mill or by preparing it by a modification of the thermal process, the effect is to reduce the modulus of extension and the hardness, and to raise the elongation at break and rebound figures.

The authors set these results in their practical context by pointing out, in effect, that a change has come over tyre technology recently; it has great achievements to its credit in increasing tyre mileage but it is now turning its attention to other qualities of tyre performance, notably to a softer 'ride', less running noise, more skid resistance, and lower heat build-up.

Sweitzer's new developments in the thermal process of carbon black manufacture yield blacks with lower oil-absorption (in the jargon, lower 'structure') and produce tread rubbers having the new desiderata.

Skid and Traction

On page 213 of the same May 1961 issue of *Rubber Age* the Columbian Carbon Company have a large, informative advertisement about these new carbon blacks, which they have called 'Neotex' blacks. There, they state that careful and severe tests on wet snow and ice have shown that treads incorporating the new blacks have a strikingly better performance than conventionally compounded treads.

Skid resistance and better traction result from the use of blacks having lower oil absorption, less aggregated.

But, notice that this phenomenon is accompanied by higher rebound figures, which I take to mean by lower hysteresis, by less energy absorption.

Now, on this side of the Atlantic, there have been a number of claims during the last 12 months or so for improved traction and skid-resistance in tyres by the use of rubbers with the exact opposite, with, in fact, high hysteresis. The name of the Dunlop Rubber Co. is especially associated with these claims. Its new tyres using its specially developed polymers have even been given the name 'Cling' to indicate the improvement in road-holding properties. The 'Cling' tyres and the 'Elite' tyres have been claimed to have these properties — and I have witnessed most impressive and conclusive road demonstrations that they do indeed behave in this way — for the reason that they have higher-than-normal hysteresis, greater absorption of input energy, and lower rebound figures.

Will someone who knows kindly explain this apparent discrepancy?

Polypropylene Fibre

I would also like to echo someone else's question. Under the title, 'The Enigma of Polypropylene' (and a sub-title: 'After the initial rush of enthusiasm, things seems to have gone quiet'), there is an excellent review article on polypropylene fibre in *Skinner's Silk and Rayon Record* for July 1961, pp. 628-9.

'There is a good chance that polypropylene will far outstrip the present big three synthetic fibres — nylon, *Terylene*, and the acrylics — within a decade'. Its tenacity, and toughness are as good, if not better, its resilience and extension modulus are of the same order. True, it has a low MP, but not impractically low, and this is actually advantageous in some fabrication processes.

Its density is outstandingly low. 'One lb. of polypropylene will go 1.7 times as far as 1lb. of rayon, half as far again as *Terylene*, and 25% further than nylon'. It has a high electrical resistance and is also very inert chemically.

Polypropylene fibres should be cheap. The raw material is low in cost and the fibre-producing process is quite straight-forward. It may be that there is a difficulty in finding a satisfactory antioxidant and light stabilizer, and perhaps colouring is not easy, but it could play a major part in the battle of the synthetic fibres during the sixties.

CHARLES JENNINGS

MEN *and* MATTERS

A Review of People and Events

by Peter Richards

A. S. BISHOP, the former chairman of Goodyear (GB) Ltd., who died last week, was a man whose influence was felt throughout the whole of the tyre and motor industry. Although he had retired as chairman in January last year, he was still on the board, and his death is a sad loss both to the company and the industry. Mr Bishop was a pioneer of giant pneumatic tyres in the early twenties, and it was mainly through him that the first of these tyres were fitted to public service vehicles.

He was a man of prodigious energy, tremendously active in trade and industry circles, and a list of his various appointments could fill the rest of this page. But I only have room to mention that he was chairman of the Tyre Trade Joint Committee; member of the Finance Executive and Management Committees and the Council of the Society of Motor Manufacturers and Traders Ltd.; chairman of the Tyre Section of the SMM and T; chairman of the TMC Mileage Group and executive member of the Motor Industry Research Association.

Sudan Hunts the Rubber

Reports from Sudan suggest that a new form of hunting is taking place there — hunting for wild rubber.

The Equatoria Projects Board is said to be making attempts to collect on a commercial scale the wild rubber which grows in parts of Equatoria and Bakhr El Ghazal Provinces.

Tribesmen who used to hunt other wild tribesmen are being urged to go out and collect it. Every lb. of wild rubber caught will be bought by the board at a fixed price. There is even the prospect of exporting it, if the quantity warrants it.

Nylon Shelters Itself

Nylon will house nylon (a hundred different uses of) at an exhibition in India. A gleaming white 35,000 cu. ft. airhouse will be used to contain the display by British Nylon Spinners Ltd. at the Indian Industries Fair at Delhi in November.

Looking rather like a vast igloo, the airhouse consists of a waterproof skin of tough but lightweight pvc-coated nylon fabric which is held up solely by air blown in by powerful fan units. There are no poles or guy ropes.

Since their introduction some years ago airhouses have become very popular. I know of a house that has been built beneath one — and another is in use as a 500-seat theatre.

Thrifty Dunlop

Thrifty Dunlop employees have joined one of the most select groups in London — the ten biggest savers.

Last week, to commemorate this achievement, their savings group secretary received a 'top ten' certificate from the Lord Mayor of London, Sir Bernard Waley-Cohen, at a special ceremony at London's Mansion House. The certificate was presented to W. G. Grote, who has been in charge of Dunlop savings since 1939.

Dunlop employees saved over £400,000 through company facilities to be fourth in the competition, which was for large organizations (over 500 employees) who have made outstanding contributions to the National Savings Movement through their savings groups.

Plastics Round the Island

Reinforced plastics chalked up a victory at Cowes earlier this month. Sailing against a record number of entries in the round-the-island race, the 30ft. glass-fibre 'Bristol I' racing yacht won the Gold Roman Bowl from more than 200 contestants.

It is the first in a batch of such yachts being built by Bristol Aeroplane Plastics Ltd., and meets the increasing demand for a reasonably-priced keelboat for national and international racing. Since the yacht also has Terylene sails, the event is regarded as a double victory for plastics.

Footwear Pioneer

After more than 30 years' association with the footwear industry G. H. Ellis, general manager of Dunlop Footwear Ltd., retires at the end of this month — but he will continue to serve in an advisory capacity, and also as a member of the Footwear company's board.

He is succeeded by N. G. Bassett Smith, present general manager of Dunlop Chemical Products division at Castle Bromwich.

Mr Ellis has been responsible for footwear manufacture at the Dunlop factories at Speke and Walton, Liverpool, and at Brook Street, Manchester. He has played a prominent part in the development of the rubber

Preparing to enter plastics: management meeting at Venesta Plywood Ltd. The company, a member of the £13m. Venesta Group, intends to manufacture expanded plastics (*see page* 116). **Discussing packaging applications of expanded polystyrene are** (*left to right*) **R. McDowall, research manager; D. G. R. Reid, director and general manager; W. P. Cruickshank, chairman; D. M. Foulds, general works manager; L. C. Webb, building products sales manager and R. F. Hawgood, packaging sales manager**

footwear industry which, with the application of many new techniques, is now joined with the main footwear industry. Mr Ellis was respectively vice-chairman and chairman of the Rubber and Plastic Footwear Manufacturers' Association from 1952-1959 and has been a member of the council of SATRA since 1958.

Chairs from Iceland

Iceland may not sound very comfortable, but it can produce some comfortable products — such as this chair from the Reykjavik firm of Sindri Ltd.

The chair's shell is made from Bakelite polyester reinforced with glass fibre. A layer of polyurethane foam ¾in. thick lines the inside of the shell and the upholstery is in Icelandic sheepskin.

The original form for the chair was developed by Sindri Ltd. using a female gypsum mould, and polishing by hand until a satisfactory shape was achieved. Production is by the hand lay-up method over a male mould. The chair is already being exported to USA and is expected to be marketed in this country shortly.

Rubber Cocktails

A ship left California last week for San Juan, Puerto Rico, with 2,500 gallons of sweet vermouth stored in drums made of rubber.

Lovers of the grape could recall no similar overseas shipment in recorded history — although wine has been shipped in everything from goat bladders to wooden casks.

The collapsible rubber drums were developed by United States Rubber Co. Called Sealdrums, they have a special food grade liner approved by the Food and Drug Administration. Each drum holds 500 gallons of liquid, and takes up little storage space when empty.

Puerto Ricans — although naturally lovers of the rum — recognize the virtues of vermouth, according to the Californian exporter. They are using the rubber drums because the cost of wooden barrels is rising, and the rubber drums are lighter. One empty sealdrum '500' weighs approximately 150lb., compared to 245lb. for the wooden barrels.

Appointments in Brief

Mr A. Elliott, a director since 1956, has been appointed deputy managing director of Precision Rubbers, a member of the John Bull Rubber Co. group.

* * *

David H. Rowney has been appointed public relations officer for Tempered Group Ltd. of Sheffield, whose products include rubber components.

* * *

Gerald B. W. Norton, previously associated with Dow's plastic sales for Europe, has been appointed special projects manager, European Area.

* * *

H. D. Sykes has been appointed resident representative in Sweden of Baker Perkins (Exports) Ltd.

* * *

Jack Kenyon has resigned from Universal Metal Products Ltd.

Polly Ester Says...

'Cold stretch — glasshouse in the arctic'

THE LEGAL ANGLE

Catapult Comeback

By a Barrister

A CATAPULT was bought by a child, not long ago, from a toyshop. Using it in the ordinary way — and for its usual, expected, unpleasant purposes — the youngster pulled back the elastic — and the plastic weapon snapped. A piece flew into his eye. He sued not the retailer who had sold him the toy but the manufacturer who had made it.

'How can that be?' you ask. 'We always understood that where a contract is made between two people, you cannot sue a third —a stranger to it. . . .'

That is right. But it was long ago settled that a manufacturer owes a duty of care to everyone who may be injured, if his product is the result of negligent manufacture — provided that he might reasonably have contemplated such a person as likely to be injured, had he turned his mind to the problem.

The leading case concerned, of all things, a snail in a ginger-beer bottle. A woman purchased the drink in a restaurant and gave it to a friend. He drank up: and fell ill. It turned out that in the murky depths of the bottle lurked the decomposing remains of a small, slimy snail.

When the manufacturer was sued, he claimed that, as he had no relationship whatsoever with the ultimate consumer, he could not be held liable. And the Court decided — for the first time, but for ever — that a manufacturer is liable, in such circumstances, to the ultimate consumer.

And the same result came of the case of the plastics catapult. The Court decided that the manufacturer, who had been negligent in producing the defective toy, must bear the responsibility for it. He must have realized that pressure would be placed on the weapon by the child and that if it was not properly made, it would break and be likely to cause damage. He would therefore have to pay for his carelessness.

Mind you, the boy could have sued the shop from which he bought the article: but that would not have helped the manufacturer. After all, it was not really the retailer's fault, so all that he would have had to do was to bring the manufacturer into the action as a 'third party', claiming an indemnity from him — a claim which would undoubtedly have succeeded.

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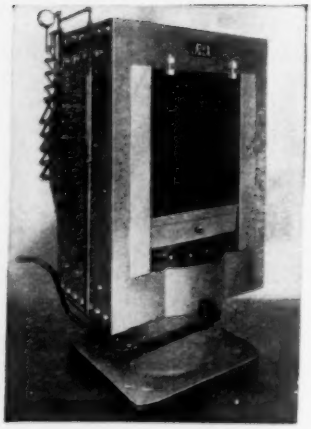

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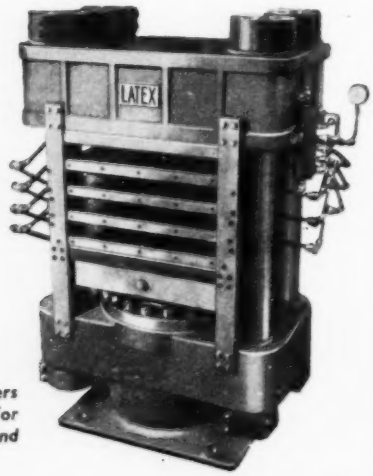

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FBRAM PRESIDENT'S REVIEW 1959-61

New Materials Mean Progress

RUBBER MANUFACTURING PRODUCTION HIGHER THAN EVER BEFORE

This is a condensed version of a review of his two years of office by the retiring president of the Federation of British Rubber and Allied Manufacturers, H. G. W. Chichester-Miles. The review was delivered at the Federation's annual general meeting last Thursday (July 20), and is available in booklet form from the FBRAM, 19-20 Berners Street, London, W.1

TWO years ago my predecessor, Jasper Frankenburg, suggested in his presidential review that our industry was already launched on a period of change. 'We must learn to accept change', he said, 'to work with it and not against it, to turn it to our own advantage and to the advantage of the community we serve'. These were wise words, and the two years which have elapsed since they were committed to paper — the years which this review is designed to survey — have amply served to illustrate their prophetic realism.

New Materials

Change is, I suppose, most obvious in our use of materials. Synthetics, plastics, fibres, resins, pigments, and new chemicals have come crowding in on us. Every day has seen fresh problems of compounding, timing, processability, tack, adhesion, stretch. No sooner is one material accepted and mastered than two more appear where it came from. Gone are the days when one could settle down happily with a half-a-dozen well-tried formulae in the secure knowledge that the quality of our product would be second to none. Drawing boards are littered with experiments, desks covered with samples. And always the nagging threat that if we don't do it, someone else almost certainly will.

Undoubtedly we should be glad of this, not resentful; we should welcome it, not try to turn the clock back. The new materials are not worse but better than the old. They widen the scope of our industry. They lead to new uses and new products, to opportunity, expansion, progress.

Trade and Profit

The rubber industry is old in years and experience, but very young and enterprising in action. It is confronted today by changes in the climate of trade as well as in technology. It has to face competition of no mean order, and at the same time serious fluctuation in raw material prices. In spite of these problems the industry continues to progress. Its production is higher than at any time in its history, and improvement in its processes and equipment continues at a gratifying speed. I am sure that the work of our Executive, Council and other committee levels, together with the ever-growing services of the Federation headquarters, contribute greatly to its progress.

It is noticeable in many commodities produced by our industry, and by others, that profit margins are declining. Some of the public look upon profit making with aversion, but I suggest that, on reflection, such people would rather work for a concern making profits than for one making losses. I wish that the public at large (especially in this manufacturing country) could accept profit making as laudable, indeed as a duty. Without doubt our industries and our country will not continue to progress unless its efforts produce margins sufficient to ensure regular replacement and modernization of plant and equipment.

That is why I regret the Government should seek new powers for raising taxation by means which increase costs of production. How much better it would be if the Government would take positive steps to help industry to lower rather than raise its costs, to encourage the exporters, and ensure real driving force in the development of our trade overseas. To support this, increased and regular publicity to our own people, including targets and achievements, would perhaps arouse public opinion to the importance and urgency of this matter and ensure that the improvement in our standards of living continues.

Reorganization

Within the Federation the principal change during the past two years has been the reorganization of its constitution and structure to rest on a system of direct membership instead of through Associations. The reorganization involved a great deal of work for the Director and his staff, and a great deal of anxious thinking on the part of the Finance Committee and the Executive. It proved an immediate and unequivocal success, and the remarkably high proportion of membership already achieved under the new scheme is a matter of very genuine congratulation to all concerned.

Natural Rubber Grades

And first, I must commend to your attention the work of the Materials Supply Committee, on which the Federation collaborates with the Tyre Manufacturers Conference. For some time now the MSC has been concerned in a world-wide campaign to bring greater order and consistency into the marketing of natural rubber. Last year this effort culminated at the Third International Rubber Quality and Packing Conference at Singapore, where all the loose ends and disagreements of the 1955 Conference were finally cleared up. All types of rubber offered on the market in any substantial quantity have now been brought under a unified

H. G. W. CHICHESTER-MILES

H. G. W. Chichester-Miles, the retiring president of the Federation of British Rubber and Allied Manufacturers, was educated at Bedford, and served in the Royal Garrison Artillery during the first world war. Afterwards he was for some time a buyer and then a sales manager in the car industry, and in 1924 he set up his own business in London as a manufacturers' agent. In 1929, he founded and registered the Empire Rubber Co. (H. G. Miles Ltd.), primarily as a sales organization with another rubber company, the object being to improve the knowledge and uses of rubber in the motor car industry. Nine years later a factory was set up at Dunstable to make and sell rubber components to the motor manufacturing industry. This was one of the first companies in the UK to undertake the bonding of rubber to metal. The organization has factories at Dunstable, at Clacton-on-Sea, and at Chichester, and also a part interest in a factory at Melbourne, Australia. Mr Chichester-Miles is a vice-chairman of the Rubber and Plastics Research Association, a past district chairman of the Rotary movement, and a Fellow of the Royal Philatelic Society.

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scheme of internationally agreed and defined grades, and arrangements have been made for further conferences at two or three yearly intervals to keep the system permanently up-to-date.

The New President

Through all the later stages, the guiding hand, the driving force — stroke, cox and coach combined in the consumers' crew — was Maurice Baker, the chairman of the MSC and a director of the Firestone Tyre and Rubber Co., whom I take this opportunity of saluting as the new President of the Federation. The Federation is fortunate. Diligence, determination and diplomacy are qualities which it can use in large quantities.

It is hoped that the new Green Book describing the grades of rubber agreed at the Conference, and the new grade samples to go with it, will be ready by the end of this year, or at the latest early in 1962. I would urge all members to make the fullest possible use of them. Select the international grade best suited to your purpose and insist on getting the rubber you order. The new types have been worked out on a thoroughly realistic basis to correspond with actual production. What to do to claim your rights is clearly set forth in the Federation's own booklet on *Natural Rubber Grades and Contracts*. Copies of grade samples will be available in the Federation offices as well as for purchase as soon as they are issued.

Standards and Specifications

Another concern of the MSC which they share with the Technical Committee, has been the need for revision of the many standards drawn up by the BSI before the war, to admit the use where appropriate of synthetic rubber as an alternative to natural. This work has now been put in hand, and already well over a quarter of the total number of specifications involved have been amended.

The Federation Specification Advisory Committee has made considerable headway in its efforts to persuade our customers to rationalize and bring up-to-date all specifications for rubber engineering components. Already more than 900 copies of the Federation's *Guide to the Drafting of Specifications for Rubber Products* have been distributed, and a third, revised, edition is in the press.

Exports

During the past two years the overseas trade committee has more especially concerned itself with the prospect of freer trade in Western Europe as a result of the EFTA agreements and the possibility of closer ties with the common market. With a view to enabling our members to take the greatest possible advantage of these developments, it enlisted the help of the publicity committee in the production of a sales booklet describing the skill and scope of the British rubber industry, emphasizing its modern outlook and listing its products under general categories. Separate editions of the booklet are being printed in German, Danish, Norwegian, Swedish, Finnish and Portuguese — 13,000 copies in all — and mailed to a carefully selected list of industrial users, merchants, importers, department stores, hospitals, and other prospective customers in the seven countries concerned

Publicity

Of the more general work of the publicity committee I need write little here, for I think we have all felt the subtle change it has already begun to effect in the public appreciation of our industry. I recall, however, with particular pride, the occasion early last year when I had the pleasure of handing over to the Science Museum in West Kensington, a permanent display in three large showcases, illustrating in a most interesting and striking form the production, processing and uses of natural and synthetic rubbers.

The Federation Staff

The permanent staff have had a most exhausting time because of the many additional duties and responsibilities loaded upon them. Amongst these additions are the reshaping of our financial structure — the change to direct membership, the search for and the arranging of new office accommodation, so very much overdue. The issue of the booklet *Why a Federation* was a task essential to the recruitment of direct members, and the interviews and correspondence involved in the new structure put an immense load on the staff, and more particularly on the director and the secretary. Their exceptional devotion to the manifold duties entrusted to them is deserving of the utmost praise, and their example has undoubtedly been responsible for the loyal co-operation of the rest of the staff.

Marley Produces Extruded Vinyl Sheet

THE Marley group is manufacturing an extruded, corrugated vinyl sheeting. Called Marleyglaze, it is designed for use as a translucent roof sheeting, and as a lightweight roof for balconies, terraces, penthouses and sheds. It can also be incorporated in interior finishes.

High Light Transmission

Initially, two profiles are being made, one with a nominal width of 30in. and 10½ corrugations, in 4ft., 6ft. 6in., 8ft. and 10ft. lengths, to match Standard 3in. asbestos; the other, to match Big Six asbestos, has a nominal width of 43in. and eight corrugations — this will be available later in the year. With its introduction lengths of both sheets will be obtainable in 6in. increments from 3ft.-10ft. The thickness of the sheet is $\frac{1}{16}$in. and 1 sq. ft. weighs approximately 8oz.

The sheeting permits up to 82% light transmission and is being produced in natural translucent and red, green, yellow and blue. Estimated retail price will be about 4s. per sq. ft. for all colours.

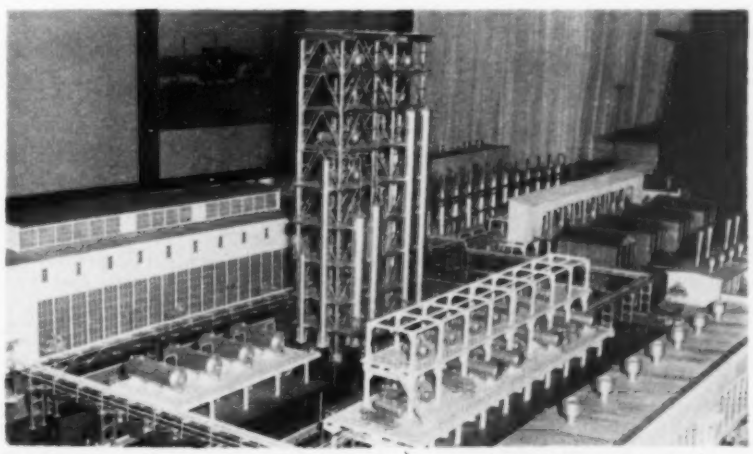
Mistron Vapor

Compounding Ingredients Ltd., 3 Chepstow Street, Manchester 1, agent for the Sierra Talc Co. of California, is carrying stocks of the latter company's Mistron Vapor.

Mistron Vapor — ultra-fine magnesium silicate — is a white reinforcing filler for rubber.

£100,000 Libel Damages

Rubber Improvement Ltd. and its chairman and managing director, John Lewis, were awarded libel damages totalling £100,000 in the High Court on Wednesday (July 19) against the *Daily Telegraph*.



Section of a working scale model of a Russian polybutadiene plant in Azerbaijan, displayed at the Soviet Exhibition at Earls Court. It has an annual output of 25,000 tons and employs 240, exclusive of maintenance personnel. The exhibition closes on July 29

Plantation Newsletter

CO-OPERATIVE SOCIETY BUYS ITS FIRST ESTATE

by our Malayan Correspondent

FROM KUALA LUMPUR

AFTER only 13 months of existence, the new National Land Finance Co-operative Society, of which several thousand Malayan estate workers are members, has bought its first rubber estate.

It has paid $3m. to buy the 2,600-acre Bukit Siding Estates in Kulim, Kedah, North Malaya. The Minister of works, Dato V. T. Sambanthan, who is also president of the Malayan Indian Congress and a founder member of the Society, handed over the cheque to H. E. Cowper, managing director of the Oriental Estates Agency.

The estate was the property of the Marquis of Bute and was the only estate owned by the family in the Federation. About the same time as the Society was formed, Bukit Siding was offered for sale and the Society began to negotiate for it.

The management of the estate agreed to allow liberal terms — a down payment of 10% of the cost on February 11 and the rest of the money by July 10. After agreeing to these terms, the Society intensified its drive to raise money from its 14,000 members and by the 'deadline' it had its full $3m.

One of the aims of the Society is to buy over estates, which are put up for sale so as to prevent them from fragmentation, which is reported to be affecting the security of thousands of estate workers. Once an estate is fragmented, the chances are that estate workers lose their livelihood and their quarters.

This is the first of other estates which the Society hopes to buy at later dates as they come onto the market. Dato Sambanthan described the deal as a real success story of a Malayan co-operative society.

Pull of the White Collar

The Malayan Government has again issued a warning to young Malayans seeking employment that they must return to the land instead of continually looking for office jobs. Good rubber tappers are still in demand in this country.

On many estates, particularly in Johore, there are vacancies for up to 100 tappers and weeders which the managements find difficulty in filling. Of the 30,000 people reported to be unemployed in Malaya, only a small minority want to work on estates.

The Ministry of Labour reported this month that a young woman tapper earned up to $471 (£56) a month last year and she had paid up her income tax dues on her earnings.

However, the National Union of Plantation Workers is sceptical of this figure. 'I think the Ministry has made a mistake', said the secretary-general of the NUPW, Mr P. P. Narayanan. But he agreed that if the report was accurate, then it must be remembered that she was only one woman out of several thousand women tappers who earned this sort of salary.

In the meanwhile, it has been stated again by officials of the NUPW that European planters are more understanding and readier to recognize democratic trade unions than are Asian planters.

C. P. R Menon, the chairman of the Malacca branch of the NUPW, has accused Asian planters, and Asian owners of estates, of lacking experience in understanding the advantages of having trade unions. He said that these people frequently put all sorts of obstacles in the way to prevent their employees becoming members of a union.

Officials of the NUPW have supported the policy of the Malayan Trades Union Congress not to enter politics. They feel that it is incumbent on trade unions not to antagonize any political party by siding with any one in particular.

They pointed out that wherever politicians had dominated a union, then that union had failed to mature.

Dunlop Petaling Jaya

Work on the building of a multi-million Dunlop Rubber tyre factory at Petaling Jaya, seven miles from here, is expected to begin in three months' time. The factory will take about 18 months to complete.

The secretary to the Ministry of Commerce and Industry, Raja Mohar, announced that initially the company would hold 61% of the capital of about $12m. The other 39% — about $4.7m. — would be open to public subscription.

'Later the company will relinquish 10% of its share to Malay subscription', he said. Raja Mohar said that the Government would arrange with the company how this 10% should be relinquished. He said that one possible way was by the participation of the newly-formed Malay Investments Co.

It is understood here that the new company will be incorporated very shortly. It has already accepted the Government's conditions for employment of as many local men as possible and for their training.

The Malayan Industrial Development Finance Ltd. announced in its annual report that it had entered into an agreement with the company to underwrite the public flotation of the new company. This means it would underwrite the public subscription of 39%.

Rubber Statistics

FRANCE — CANADA

RUBBER consumption in France in April 1961 was 18,762 tons, compared with 18,974 tons in the same month last year. The French Ministry of Industry and Commerce has issued the following statistical breakdown (in tons):

	April 1961	April 1960
Natural rubber ..	9,796	10,029
Latex	1,112	1,243
Synthetic rubber ..	7,854	7,702
Total.. ..	18,762	18,974
SYNTHETIC BREAKDOWN		
Butyl	1,089	1,111
GRS Buna and Polysar	5,533	5,396
Others	976	982
Artificial latex	256	213

French tyre production in May this year is estimated at 22,350 tons compared with final figures for April of 21,675 tons and 22,165 tons in May 1960. This brings estimated production for the first five months of this year to 114,055 tons compared with 112,090 in the same period in 1960. Imports of tyres in May totalled 1,035 tons against 1,149 tons in April, bringing total imports for the first five months to 4,911 tons, while exports totalled 5,891, 4,191 and 24,975 tons. Imports in May 1960 totalled 728 tons against 682 in April bringing total imports to 3,499 tons while exports were 5,124; 5,081 and 27,350.

Industrial rubber production in May is estimated at 19,000 tons compared with a revised estimate for April of 18,120 tons, bringing estimated production for the first five months to 93,830 tons, compared with 94,095 tons in the same period in 1960.

Canada

Consumption of all rubber in May rose for the second successive month to 9,630 long tons from 8,390 a year earlier. With decreases in each of the first three months of this year, consumption in the January-May period declined to 43,262 long tons from 47,452 a year ago.

Consumption of natural rubber in May fell to 2,690 long tons from 2,872 a year earlier, while synthetic rubber rose to 5,386 long tons from 4,179 and reclaimed rubber to 1,554 long tons from 1,339. January-May consumption of natural rubber decreased to 12,539 long tons from 16,029 and reclaimed to 6,766 long tons from 7,552, while synthetic rubber increased to 23,957 long tons from 23,871.

Rubber and Plastics Stock Market

A REVIEW OF PRICES AND TRENDS

SHARES have staggered from one bout of the jitters to another in the stock market over the past few weeks. The threat of the Chancellor of the Exchequer's suspended axe has had a spine-chilling effect on investors and more especially the buyers. Without so far showing his hand Mr Selwyn Lloyd has scored a notable success by bursting the boom that raged along Throgmorton Street for months.

Last week the *Financial Times* index of industrial shares finished 7.3 lower and at 306.2 has lost almost all of this year's gain. A sombre thought especially as one at the moment is unable to see the end of the current easier trend. Ahead, the market will run into the problem of new issues with many companies asking for more millions to back their programmes of expansion and the like. Already the list of companies that have asked shareholders for more cash is impressive, but I feel that we have only seen the beginning even though it runs to over the £100m. mark.

An increase of 10% in purchase tax plus a payroll tax. These are the two main measures, together perhaps with a rise in Bank Rate, that most people anticipate to follow the Chancellor's speech which is promised for next Tuesday. What kind of effect these restraints will have is difficult to say at this juncture. Many chairman will no doubt look forward to a few sleepless nights over the coming months. There is also the problem of whether or not the Government will decide to join the Common Market. No one, it seems, has a clear and concise opinion as to whether or not a link-up with the 'six' will bring the rewards that some people have forecast But it is the uncertainty that has a killing effect on sentiment in the City where investment matters are of prime consideration. One thing is for sure and that is during the autumn, movements in share prices will be irregular and even perhaps a little lower. Until all the factors that we have discussed become clearer, business will remain at a low ebb.

As forecast at the time of the 'rights' issue, DISTILLERS are paying a dividend of 13½%. The final dividend of 8½% is on the capital increased by the one-for-five share bonus and on the shares issued against the BRITISH XYLONITE take-over deal. The group's profits from whisky, gin, plastics and chemicals grew to a massive £34,839,000, a rise of £2m. And after depreciation, tax and minority interests there is £17,224,000 against £16,866,000 attributable to the parent company.

Share Price Movements

Par Value	Company	1961 High	Low	July 8	Latest
£1	A.E. Ind. Ord.	48/6	36/3	39/9	36/6
5/-	Albright & W. Ord.	29/6	22/9	25/-	23/-
£1	„ „ „ 5% Pref.	17/3	13/6	14/-	14/-
5/-	Anchor Chemical Ord.	25/6	16/-	21/-	21/6
4/-	Airfix	53/-	34/6	51/-	52/6
4/-	„ Non Voting	51/3	33/6	48/-	51/-
5/-	Andersons Rub. Ord.	—	—	3/9	3/9
£1	Angus Geo. Ord.	83/-	58/6	71/-	70/-
5/-	Ault & Wiborg Ord.	34/-	25/9	30/-	28/9
£1	Avon India Rubber Ord.	46/6	30/-	38/9	37/6
£1	„ „ „ 6% Pref.	19/3	17/6	18/-	17/6
10/-	Bakelite Ord.	66/3	42/3	51/3	48/9
£1	„ 6% Pref.	19/3	16/6	17/6	17/6
£1	Baker Perkins Ord.	59/6	40/6	53/-	48/9
4/-	Bank Bdg. Rubber Ord.	3/6	1/9	2/3	2/3
4/-	Bettix	11/9	7/6	10/6	9/6
4/-	Brammer H. Ord.	17/-	15/6	16/3	15/6
10/-	Bridge, David Ord.	60/-	32/6	32/6	33/6
5/-	Bright, John Ord.	9/6	7/-	8/3xc	7/9
5/-	Brit. Blting & Asb. Ord.	24/-	17/6	22/3	21/6
£1	„ „ „ „ Pref.	—	—	15/9	13/3
5/-	British Electronic Indus.	15/6	10/6	11/3	10/6
2/-	Brit. Ind. Plas. Ord.	14/-	7/9	13/9	13/9
2/-	„ 10% (tax free) Pref.	9/9	4/3	9/9	9/9
£1	British Xylonite Ord.	93/-	63/-	93/-	93/-
£1	„ „ 5% Pref.	18/9	14/-	15/-	15/-
£1	BICC Ord.	62/6	50/3	58/6	56/3
5/-	BTR Ind. Ord.	19/9	10/9	12/-	11/-
£1	„ „ 7½% Pref.	21/6	20/-	21/-	20/-
£1	Courtaulds Ord.	47/6	34/6	36/-	36/-
£1	„ 5% 1st Pref.	16/-	14/-	14/9	14/3
£1	„ 6% 2nd Pref.	18/3	15/9	16/9	16/-
4/-	Cow, P. B. Ord.	10/6	7/6	9/7½	9/3
£1	„ „ 5% Pref.	14/3	13/3	13/6	13/6
1/-	Dannimac Mfg. Ord.	15/3	12/-	13/9	12/-
10/-	De La Rue Ord.	70/-	53/9	57/6	54/-
£1	„ „ „ 3½% Pref.	10/6	9/6	9/6	10/-
10/-	Distillers Co. Ord.	41/3	31/-	35/9	33/6xc
£1	„ „ 6% Pref.	20/3	17/6	17/9	17/6
£100	„ 5% Conv. Loan	£96	£90	£92½	£91½
£100	„ 5½% Unsec. Loan	£86½	£76	£78½	£76½
10/-	Dunlop Rubber Ord.	29/-	21/6	26/-	26/-
£1	„ „ 5½% Pref.	16/-	13/9	15/-	14/-
£100	„ 3½% 1st Debs.	£69	£67	£68	£67½
£100	„ 4½% 2nd Debs.	£79	£76	£78	£78
£1	Eng. Elect. Ord.	40/6	30/9	33/9	30/-
4/-	Ebonite Cont. Ord.	8/6	6/-	7/6	6/6
£1	English China Clays Ord.	117/6	80/-	97/6	94/-
£1	Goodyear Tyre 4% Pref.	11/6	10/-	11/3	10/3
5/-	Greeff Chem. Ord.	37/6	22/9	31/-	29/3

Par Value	Company	1961 High	Low	July 8	Latest
10/-	Greeff Chem. 5½% Pref.	8/3	7/-	7/6	7/-
4/-	Greengate & Irwell Ord.	6/9	5/-	5/6	5/3
5/-	Hackbridge Hldg.	6/9	4/9	5/-	4/9
£1	Harrisons & Crosfield Dd.	57/6	48/3	51/-	49/-
1/-	Hunt & Moscrop Ord.	2/3	1/3	2/-	2/-
£1	Imp. Chem. Ord.	81/6	63/-	69/9	65/9
£1	„ „ 5% Pref.	16/3	13/6	15/-	14/-
£100	„ 4½% Unsec. Loan	£83	£76½	£79½	£78
£100	„ 5½% Conv. Loan	£93	£86	£86	£86
1/-	Kleemann (O. & M.) Ord.	21/3	8/3	18/9	19/-
£1	„ 6½% Pref.	22/3	16/3	22/3	22/3
5/-	Laporte Ind. Ord.	30/9	24/-	26/9	24/6
£1	„ „ 7½% Pref.	23/-	21/3	21/3	21/3
£1	Leyland & Birm. Rubber Ord.	59/3	46/3	53/9	50/-
£1	„ „ „ 6% Pref.	18/9	15/-	15/7½	15/-
2/-	London Rubber	15/6	9/6	14/3	13/3
£1	„ 6% Red. Cum. Pref.	20/-	16/9	16/9	16/9
£1	McKechnie Bros. Ord.	43/-	27/-	63/9	40/-xc
£1	„ „ 'A' Ord.	45/-	35/-	66/3	38/9xc
£1	„ „ 6% Cum. Pref.	18/-	16/-	16/6	16/6
5/-	Monsanto Chem. Ord.	27/6	20/6	21/9	20/6
£1	„ „ 3½% Pref.	12/6	11/3	12/-	11/3
£100	„ „ 6% Debs.	£98	£89	£90	£89½
5/-	Miles (H.G.) Hldgs. Ord.	7/9	7/-	7/6	7/6
2/-	Movitex	—	—	5/7½	5/3
£1	North British Rubber	21/3	13/-	13/-	13/-
5/-	Northwestern Rubber	13/-	9/-	12/-	12/-
5/-	Plastic Enginrs. Ord.	40/-	28/6	39/6	38/9
10/-	Projectile & Eng. Ord.	50/6	22/6	39/6	33/6
5/-	Redfern Holdings Ord.	3/9	2/9	2/10½	2/10½
2/-	RFD Ltd. Ord.	6/3	3/6	4/9	4/9
£1	„ „ 5½% Pref.	15/-	12/6	12/6	12/6
2/-	Rubber Imp. Ord.	6/3	3/3	3/6	3/9
2/-	„ „ 'A' Ord.	5/-	2/6	2/6	2/6
£1	„ „ 5% 1st Pref.	13/3	11/3	12/3	12/3
5/-	Rubber Reg. Ord.	18/3	16/9	18/-	17/9
4/-	Shaw Francis Ord.	24/6	14/-	14/6	14/9
2/-	Silentbloc Ord.	10/6	8/3	9/6	9/3
5/-	Storey Bros.	46/-	35/-	37/9	35/3
2/-	Sussex Rubber Ord.	2/7½	1/9	1/9	1/9
5/-	Sutcliffe Speak Ord.	18/6	13/6	17/-	16/3
£1	Tootals	35/6	28/-	30/3	29/9
£1	Turner & Newall Ord.	78/-	55/-	63/-	61/-
£1	„ „ „ 7% Pref.	21/6	19/-	19/9	19/3
5/-	Universal Asbestos Ord.	27/-	21/3	23/6	23/-
£1	Venesta Ord.	76/-	61/-	65/-	64/9
5/-	Viscose Dev. Ord.	16/3	13/3	14/9	14/9
5/-	Warne W. (Holdgs.) Ord.	21/6	14/9	21/3	20/-

Rubber Markets

LONDON

Rubber prices in London finished the week July 19 with little net change. The market fluctuated within a narrow margin but once again most movements were instigated by similar trends at origin. The volume of business in the landed position was comparatively small and mainly restricted to covering, trading in physicals was light, dealers said. Higher quality sheets were subjected to a modest enquiry while offgrades though largely neglected, came in for a little more attention towards the end of the week.

Latest prices are as follows:

No. 1 RSS Spot: 24⅞d.-25⅛d.
Settlement House:
August 25d.-25⅛d.
September 25⅛d.-25⅜d.
October 25⅛d.-25⅜d.
October/December 25⅛d.-25¼d.
January/March 25⅛d.-25¼d.
April/June 25¼d.-25½d.
July/September 25¼d.-25½d.

No. 1 RSS cif basis ports:
August 24⅞d.-25d.
September 24⅞d.-25⅛d.

Godown:
August 84½ Straits cents nominal.

LATEX

Centrifuged 60% latex per gallon in drums, seller, September, October, 14s. 7d., cif European ports. Spot, seller, 15s. Bulk, seller d.w. 14s. 5d. Normal, seller, September, October, 11s. 7d.

NEW YORK

The New York rubber market ruled as under on July 17:

DEALERS' PRICES

	US cents per lb., ex-dock	
	July 17	Previous
No. 1 RSS, July ..	29⅜a	29⅜a
Aug. ..	29⅜a	29⅛a
No. 2 RSS, July ..	29⅛a	29⅛a
Aug. ..	29⅛a	29⅛a
No. 3 RSS, July ..	29⅛a	29⅛a
Aug. ..	29⅛a	29⅛a
No. 1 RSS, Spot ..	—	—

FUTURES—REX CONTRACT

	July 17	Prev. Close
July ..	29.50b–30.20a	29.30b–29.85a
September	29.50b–29.60a	29.30b–29.40a
November	29.40b–29.50a	29.20t
January..	29.15b–29.35a	29.05b–29.15a

Sales: Six. Tendency: Very steady.

Futures were steady on light buying during July 17. Dealings were quiet. Physical rubber was steady. Modest dealer business in the October - November - December deliveries was reported. Factory interest was quiet. In late dealings, futures were very steady. Physical rubber continued quiet.

SINGAPORE

The market was slow to open on July 17, the majority of dealers having little incentive to trade. Fluctuations were small and what lower sheet interest there was found sellers somewhat reserved. The market closed the morning session on a quiet note. Conditions were very quiet in the afternoon. Prices hardly moved. Lower sheets were in small demand. After House, the market was quiet.

	Malayan cents per lb., fob Malayan ports to open ports	
	July 17	Prev. Close
No. 1 RSS, Aug. ..	85⅜–85⅝	85⅜–85⅝
Sept. ..	85⅜–86	85⅜–86⅛
No. 2 RSS, Aug. ..	84⅞–85⅛	85⅛–85⅜
No. 3 RSS, Aug. ..	84 –84⅛	84 –84⅛
No. 4 RSS, Aug. ..	80⅛–81⅛	80⅛–81⅛
No. 5 RSS, Aug. ..	72⅛–73⅛	72⅛–73⅛
No. 1 RSS, Spot ..	85 –85⅛	85 –85⅛
No. 3 blanket thick re-milled crepe, Aug.	70½–71½	71 –72
No. 1 fine pale crepe, Aug.	92 –93	91½–92½
2X thin brown crepe, Aug.	69¼–70¼	69 –70
Tendency:	Quiet.	

The Industries Syndicate quote latex, native produce, 60% centrifugal, packed in rectangular drums, fob, at 168.00d. per gallon.

AMSTERDAM

The Amsterdam rubber market ruled as under on July 17:

	Guilders per kilo	
No. 1 RMA	July 17	Previous
July	2.36	2.36
August	2.36	2.36
September ..	2.36	2.36
July/September ..	2.36	2.36
October	2.37	2.37
November	2.37	2.37

Sales: Nil. Tone: Quiet.

DJAKARTA

	Rupiahs per kilo	
	July 17	Previous
Spot No. 1 Priok ..	33.00b	33.00b
Spot No. 2 Priok ..	32.00b	32.00b
Spot No. 3 Priok ..	31.00b	31.00b
No. 1 fine pale crepe, spot	31.00a	31.00a
Tendency:	Quiet.	

CEYLON

The price of No. 1 RSS at Colombo on July 17 was 103½ (103½) Ceylon cents per lb.

BANGKOK

The price of No. 1 RSS at Bangkok on July 17 was 27.37½ (27.37½) US cents per lb.

IRI GOLF

Manchester

The Manchester section of the Institution of the Rubber Industry Golfing Society held its competition for the captain's prize, at the Romiley Golf Club recently.

The winner was B. J. Newey, with a net score of 69, off a handicap of 5. A. F. Snaders was the runner-up with a net score of 70 off a handicap of 19.

This year's IRI Wallwork Cup winner was the Scottish section's W. W. Somerville, (*RPW*, **June 24, 1023**)

The following also received prizes: B. J. Newey, A. F. Snaders, E. Cheetham, L. R. Allanby, S. A. Mouseley, H. C. Redfern, J. L. Ferguson, T. R. Waring, E. Morris, A. Lord, S. K. Roberts, E. Crewdson and E. Bowker. Special prize, G. H. Mankelow.

Prizes were donated by: L. R. Allanby, West and Senior Ltd.; W. Valentine, Metals and Alloys (Birmingham) Ltd.; F. M. Read, British Recovered Rubber and Chemical Co. Ltd.; T. A. Wilson, British Recovered Rubber and Chemical Co. Ltd.; A. Lord, Hubron Rubber Chemicals Ltd.; H. G. Redfern, Rubber Regenerating Co. Ltd.; A. F. Snaders, Rubber Regenerating Co. Ltd.; T. R. Waring, Imperial Chemical Industries Ltd.; E. Morris, Greengate and Irwell Rubber Co. Ltd.; and G. Betts, Travis Industries Ltd.

London

The London section played at Moor Park Golf Club for the Worthington Cup. This was won by the captain, D. Davies, with 35 points; the runner-up was J. I. Cunneen with 34 points.

In the afternoon a four-ball better ball Stableford Competition was won by L. V. Jennings and M. Merz with 41 points. Second were J. E. Pilbrow and L. B. MacQueen with 40 points.

The last meeting of the season, the section's invitation meeting, will be held at Coombe Hill Golf Club on Wednesday, September 20.

Industry INTELLIGENCE

Technical Data

New Pigments Range

Ferro Enamels Ltd., of Wombourn, Wolverhampton, has produced a new range of non-dusting basic pigments. The new range is said to present a major advance in pigments for the plastics industry as a whole. Many outstanding properties are claimed for the new pigments, the most important of which is stability in heat and light fastness to temperatures in excess of 300°C. In addition, they are non-bleeding and migrating and give good tintorial power, as well as clean and bright colour shades; combined with the properties of non-dusting, minimum contamination and minimum purging time, the Ferro pigments should considerably reduce the handling problems that have until now faced the industry.

The colours are compatible with one another, and can be blended together, thus providing a variety of shades with a small colour range.

The new pigments are said to be suitable for all grades of polystyrene, polythene, nylon, polypropylene, cellulose acetate, phenolics, ureas, polyester and epoxy resins and pvc.

New Silicone Resin

Midland Silicones Ltd., 68 Knightsbridge, London, S.W.1, has recently developed a new resin for impregnating asbestos board — DP 2728 — supplied as a low-viscosity solution in toluene.

Asbestos cement board impregnated with DP 2728 is claimed to retain good electrical insulating properties for long periods even in conditions of 100% relative humidity, whereas under similar conditions untreated board will soon show a serious loss of insulation resistance.

Silicone-impregnated asbestos board is used for arc chutes in air-break switchgear or as spacing insulation on electrical apparatus. It is said to be particularly useful in the construction of dry-type transformers, in domestic appliances and as a substitute for paper/phenolic boards where heat or flame resistance is needed.

Information on Silicone Resin DP2728 is given in Preliminary Data Sheet C33, available from Midland Silicones at the address given above.

Rocol Molytherm Grease

Rocol Molytherm grease has been designed to provide lubrication for industrial plant and machinery at very high temperatures. Based on a high flash point oil and non-soap thickener which is said to be unaffected by heat or chemicals, this grease is soft enough to be applied through grease cups. It is claimed to be resistant to steam and water, and to show resistance to the stripping action of solvents and vapours.

Publication No. 17, available from Rocol Ltd., Rocol House, Swillington, Leeds, describes this grease and gives illustrations showing its heat stability and a list of high temperature achievements in the chemical and textile industries.

Publications

Durestos Moulding Materials

Turner Bros. Asbestos Co. Ltd., Rochdale, has issued a booklet on Durestos resinated asbestos moulding materials. These materials are all intimate blends of asbestos and thermosetting resins and are available in three forms — felt, flock and powder. They are claimed to have features that recommend them for use in industry and for general applications where a high strength component is required.

In the felt section of the booklet mention is made of grades available, storage life, and moulding, together with an article on the Durestos fan housing on the Comet 4. The second section — flocks and powder — comprises general data and information on storage life and moulding.

Delayed Action Accelerators

The American Cyanamid Co., Rubber Chemicals Dept., Bound Brook, New Jersey, has issued Cyanamid Rubber Chem. Lines, Vol. 10, No. 3. The main article is called 'Antiozonants Require Delayed Action Accelerators', and details are given on a Pronar butyl modifier claimed to be highly active, non-staining and for black, white and light-coloured stocks. The paper concludes with information on the effect of high processing temperatures of delayed action accelerators.

Epoch Pipe System

British Aeroplane Plastics Ltd. has issued a pamphlet on the Epoch non-corrosive, high pressure plastics pipe system which has been developed specifically to meet the demands of industry for large bore, highly corrosion-resistant pressure piping.

The pipe and fittings are claimed to be virtually unaffected by soils, seawater, demineralized water and the majority of dilute acids and alkalis, even up to temperatures of 140°C. Said to be as strong as steel, they are, because of their flexibility, suitable for laying over rough or uneven ground or in locations where soil subsidence is liable to occur.

Further information can be obtained from the Sales Department, BAPL, Filton House, Filton, Bristol.

Topane from I.C.I.

Topane is I.C.I.'s brand of ortho phenylphenol, and is soluble in organic solvents: the water-soluble grade, Topane WS, is sodium ortho phenylphenate. Topane is claimed to be the ideal treatment for preventing bacterial and fungal degradation in adhesives.

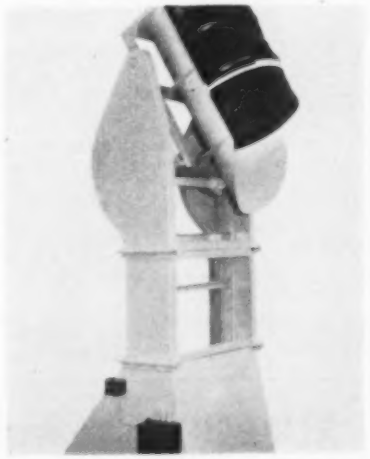
Further information together with a booklet on Topane which gives details on its use in glue and gelatine, starch, dextrin, cellulose, casein and latices, is available from I.C.I. Sales Office, P.O. Box 19, Templar House, 81-87 High Holborn.

Machines, Materials and Equipment

Lifting and Tipping Machine

Russell Constructions Ltd. has developed a unit which is claimed to lift any kind of container weighing up to 10cwt. and to tip it so as to empty the contents into a hopper, truck, mixer or other receptacle. This machine, known as the Hi-Tip has a minimum height of lift of 4ft. 6in. Vertical sections can be added to increase this dimension to any height desired.

Fabricated of ¼in. mild steel of all-welded construction it consists of a base, a top unit and centre sections. The base houses the electrical equipment, control mechanism, main drive and chain compensating device. The



machine is powered by an electric motor with a self-contained braking unit.

The speed of lift is 30ft./min. and the standard tipping angle is 30° from the vertical. The cradle can be adapted to take any type of container and the chute shaped to suit the material being handled.

Further details may be obtained from the manufacturers at Russell House, Adam Street, London, W.C.2.

NEW COMPANIES

Heaven - Sent Products (1961) Ltd. (693,708). May 26. Capital: £1,000 in £1 shares. To carry on the business of manufacturers of, and dealers in, plastics foam products, etc. The directors are: Diane Oarmsburgh, 8 Gairloch Avenue, Stretford, Manchester; Jennifer Mendelsohn and Malcolm L. Mendelsohn, both of 36 Water Park Road, Salford, 7. Regd. office: 2 Empire Street, Manchester, 8.

Filtrona Development Ltd. (693,788). May 29. Capital: £1,000 in £1 shares. To conduct, promote and develop research and experimental work of all kinds in connexion with the textile, fibre, fabric, chemical, plastics, paper, pulp, wood and tobacco industries, etc. The directors are: Ernest G. Beaumont, 3 Granard Avenue, S.W.15; Francis R. Davenport, 6 Barnett Wood Lane, Ashtead, Surrey. Regd. office: 21/4 Chiswell Street, E.C.1.

Bendon Plastics Ltd. (694,037). June 1. Capital: £1,000 in £1 shares. The directors are: Robert V. Bennyworth, 27 Southwood Gardens, Ramsgate; Donald J. Ebdon, 57 Gilford Road, Deal. Regd. office: 78 Queen Victoria Street, E.C.4.

Circle Tyre Distributors Ltd. (694,015). May 31. Capital: £100 in £1 shares. The first directors are to be appointed by the subscribers.

Research and Design Ltd. (692,898). May 16. Capital: £100 in £1 shares. To carry on the business of specialists in the design, development and use of plastics, etc. The directors are: Francis F. Partridge, 2 Elmtree Rise, Hampton-in-Arden, Warwicks.; George J. Painter, 15 Howard Road, Kings Heath, Birmingham, 13. Regd. office: 1,266 Warwick Road, Knowle, Solihull.

Allard Tyre Service Ltd. (693,347). May 23. Capital: £4,500 in £1 shares. To carry on the business of manufacturers of, and dealers in, tyres, etc. The directors are: Norman F. Allard and Bernardine Allard, both of 6 The Glebe, Hinton Charterhouse; Frank J. Chappell, 85 Stackpool Road, Southville, Bristol, 3; Maurice W. Earle. Regd. office: Cocklebury Road, Chippenham.

Kinsite Ltd. (693,404). May 23. Capital: £2,000 in £1 shares. To carry on the business of manufacturers of, and dealers in, plastics, modelling and moulding materials, etc. The directors are: Peter O'Neill, Manor Farm, Matchams Park, Ringwood, Hants; Eric W. Stuart, Pied Piper Hotel, St. Leonards, Ringwood, Hants (director of Pied Piper (Ringwood) Ltd.). Regd. office: Kinson Potteries, Hamworthy, Poole, Dorset.

Morning (Byfleet) Ltd. (696,509). June 14. Capital: £1,000 in £1 shares. To carry on the business of manufacturers and processors of, and dealers in, plastics modelling and moulding materials, substances and compositions, etc. The directors are: Maurice A. Burden, 23 Grove Lane, Coulsdon, Surrey; Dennis C. Bunch, 233a Cavendish Road, Balham, S.W.12 (directors of Morning (Croydon) Ltd.). Regd. office: 48 London Fruit Exchange, Spitalfields, E.1.

Plastic Utilities Ltd. (693,468). May 23. Capital: £100 in £1 shares. To acquire the business of 'Plastic Utilities' carried on by L. F. Hurle; to carry on business as manufacturers of plastics goods, etc. The first directors are to be appointed by the subscribers.

Increases of Capital

Fibrenyle Ltd. (408,017), manufacturers of plastics goods, etc., 157 Dukes Road, W.3. Increased on September 27 1960, by £15,000 in £1 ordinary shares, beyond the registered capital of £20,000.

H. L. Kinns Ltd. (655,086), designers and manufacturers of plastics materials, etc., 14/15 Coleman Street, E.C.2. Increased on August 29 1960, by £8,500 in 5,500 preference and 3,000 ordinary shares of £1 each, beyond the registered capital of £2,500.

Bettix Ltd. (345,529), thermoplastic material moulders, etc., Dunbar Road, New Malden, Surrey. Increased on November 30 1960, by £115,000 in 187,125 ordinary and 387,875 'B' ordinary shares of 4s. each, beyond the registered capital of £60,000.

D. and E. Plastic Components Ltd. (610,188), Coventry Civic Aerodrome, Baginton, near Coventry. Increased on September 30 1960, by £19,900 in £1 ordinary shares, beyond the registered capital of £100.

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APPLICATIONS are invited for the position—foreman, extrusion department of a rubber company in Surrey. Pension and bonus schemes in operation.—Write in confidence, giving full details of age, experience and present salary to Box 1195. (1195)

A QUALIFIED rubber technologist is required by Anchor Chemical Co. Ltd., Manchester, to fill a new post in their rubber service and development laboratories. The position involves interesting work on widely varied technological problems, including those arising from customers' enquiries and in the company's programme for the development of new compounding ingredients for rubbers. Ability to plan experimental work for a team of assistants, and to report their work clearly and concisely is required. Minimum qualification AIRI, or a science degree together with a few years' experience in compounding rubbers. The company operates a profit-sharing scheme and a contributory pension scheme.—Apply with particulars to the Technical Director, Anchor Chemical Co. Ltd., Clayton, Manchester, 11. (1193)

MANAGER wanted for new latex foam department. State experience and salary required.—Box 1200. (1200)

RUBBER TECHNOLOGIST

required, Associateship standard, to take charge of a team engaged on compounding research and physical test development, applied to a range of polymer types.

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An outstanding opportunity arises for a Senior Rubber Technologist of AIRI standard to join a young and expanding rubber company producing first-quality products, situated in the North Midlands. Applicants should be aged 28-35 and must possess a comprehensive knowledge of rubber-to-metal bonding, the formulation of compounds to specification allied to product development, and process development and control. The successful applicant must convince the company of his ability to keep pace with the assured future development of the company which, although young, has acquired a reputation for quality of product. Present staff are aware of this vacancy.—Reply with full particulars, stating salary required, in confidence to Box 1188. (1188)

CHEMIST/TECHNOLOGIST required for control and development work in spreading, calendering and adhesives field. Applicants with practical knowledge of PVA coating preferred. Should possess an LIRI and DPI as minimum qualifications. Salary will be in accordance with qualifications and experience.—Written applications giving employment history should be addressed to Lindsay and Williams Limited, Cable Makers' Supplies, Manchester, 11. (1197)

HAFFENDEN—RICHBOROUGH LTD. Works manager requires technical assistant to control compounding and general moulding processes. AIRI an advantage but not essential.—Applications with details of past experience in confidence to the Secretary, Richborough Rubber Works, Sandwich, Kent. (1189)

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PRECISION Rubbers Limited, Bagworth, Leicester, have a vacancy for a young engineer to undertake development in connection with the production of precision rubber engineering components. The post provides considerable scope for one with initiative and would be filled best by someone with experience in the rubber industry, although this is not an essential requirement.—Apply in writing, giving age, particulars of education, training and qualifications, to the Technical Director. (1198)

RUBBER technologist, age 23-35, required for work in the field of specialised synthetic rubber components. Ability to deal practically with technical enquiries and production problems essential. Good prospects can be offered to one with initiative.—Applicants should write, giving full details of age, education, training and experience to the Technical Director, Precision Rubbers Limited, Bagworth, Leicester. (1199)

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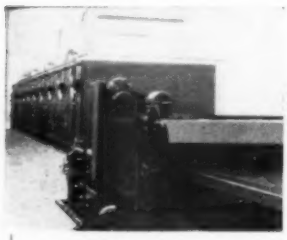

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